

KODAK Digital Science™ **Calibration Utility**

**for MICROSOFT WINDOWS
and MACINTOSH**

User's Guide

Contents

Introduction

What's in this Guide	v
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1 Calibration Utility for MICROSOFT WINDOWS

Installation	1-1
System Requirements	1-1
Recommended System Configuration	1-1
Minimum System Configuration	1-1

Operating the Calibration Utility	1-3
Starting in Windows 3.1x	1-3
Starting in Windows 95	1-4
Using Easy Cal to Calibrate Your Printer	1-6
Easy Cal Step 1	1-7
Easy Cal Step 2	1-8
Easy Cal Step 3	1-10
Easy Cal Step 4	1-12
Easy Cal Step 5	1-14
Using Normal Utility to Calibrate Your Printer	1-16
Setting Preferences	1-17
Selecting and Setting Up a Printer	1-18
Creating a New Calibration Document	1-19
Selecting a Starting Point for the Calibration Document	1-20
Opening an Existing Calibration Table	1-26
Using the Calibration Document Window	1-28
Calibrating the Printer	1-29
Visual Gray Balance	1-29
Visual Linearity	1-35
Densitometer	1-39

Option Descriptions	1-45
File Menu	1-45
Edit Menu	1-46
Calibration Menu	1-46
Printer Menu	1-49
Easy-Cal Menu	1-49
Calibration Table Dialog Box	1-50
Calibration Document Window	1-52
 2 Calibration Utility for MACINTOSH	
Installation	2-1
System Requirements	2-1
Recommended System Configuration	2-1
Minimum System Configuration	2-1
 Operating the Calibration Utility	2-3
Using Easy Cal to Calibrate Your Printer	2-4
Easy Cal Step 1	2-5
Easy Cal Step 2	2-7
Easy Cal Step 3	2-9
Easy Cal Step 4	2-11
Easy Cal Step 5	2-12
Using Normal Utility to Calibrate Your Printer	2-14
Setting Preferences	2-15
Selecting and Setting Up a Printer	2-16
Creating a New Calibration Document	2-17
Selecting a Starting Point for the Calibration Document	2-18
Opening an Existing Calibration Table	2-23
Using the Calibration Document Window	2-24
Calibrating the Printer	2-25
Visual Gray Balance	2-25
Visual Linearity	2-31
Densitometer	2-35

Option Descriptions	2-41
File Menu	2-41
Edit Menu	2-42
Calibration Menu	2-42
Printer Menu	2-45
Easy-Cal Menu	2-45
Calibration Table Dialog Box	2-46
Calibration Document Window	2-48
 Appendix A Kodak XLS 8600 and Kodak DS 8650 Printers	
Ribbon Media Choices	A-1
Printer Ribbons (V1.0)	A-2
Printer Ribbons (V1.5)	A-3
Using the Calibration Utility to Download	
Default Calibration Tables	A-4
Putting Your Printer in Raster Mode	A-4
Calibrating Your Printer for V1.5 Ribbon	A-5
Calibrating Your Printer for V1.0 Ribbon	A-7
Do I Need to Calibrate My Printer?	A-8

Index

Introduction

The *Kodak Digital Science*™ Calibration Utility for MICROSOFT WINDOWS and MACINTOSH (Calibration Utility) allows you to bring your printing system to the best possible color response.

Kodak thermal dye diffusion printing systems are composed of printers and printer media (thermal ribbon and paper or transparency material). Normal variability in the manufacturing processes of printers and media may cause slight variations in light gray (low density) areas of prints. The human visual system is sensitive to color changes in low density areas on prints and you may occasionally want to adjust your printer output to match viewing conditions.

The Calibration Utility allows you to select export and import modules, open and save calibration tables, enter measurement information from a test print, and calculate a new calibration table. The calibration test prints are key to the Calibration Utility. The new calibration table allows you to adjust the levels of cyan, magenta, and yellow dye to create a neutral gray with the correct density.

What's in this Guide

This guide consists of the following chapters:

Introduction—describes the calibration prints and the recommended process for using the Calibration Utility.

Chapter 1: Calibration Utility for MICROSOFT WINDOWS—describes how to use the Calibration Utility on WINDOWS systems.

Chapter 2: Calibration Utility for MACINTOSH—describes how to use the Calibration Utility on a MACINTOSH system.

Appendix A: Kodak XLS 8600 and Kodak DS 8650 Printers—describes the printer ribbon media choices for these printers and gives instructions for downloading new calibration tables for your printer.

Index—a comprehensive index is included.

1 Calibration Utility for MICROSOFT WINDOWS

This chapter describes how to install and use the Calibration Utility on a system that uses Microsoft Windows 3.1, Windows for Workgroups 3.11, or Windows 95. You should be familiar with the Windows environment.

Installation

See the "Read Me" for instructions for installing the calibration utility.

System Requirements

Recommended System Configuration

- 486 or Pentium processor
- MS-DOS, version 6.22 or later
- Microsoft Windows for Workgroups 3.11 or Windows 95
- 16 MB of RAM
- 4 MB of hard disk space
- CD-ROM drive
- color monitor

Minimum System Configuration

- 386 processor
- MS-DOS, version 5.0 or later
- Microsoft Windows 3.1, Windows for Workgroups 3.11, or Windows 95
- 8 MB of RAM
- 4 MB of hard disk space
- standard color or black and white monitor
(standard VGA; minimum resolution 640 x 480 pixels)

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Operating the Calibration Utility

The following steps describe how to start the Calibration Utility.

NOTE: The export module for the printer you want to calibrate must be installed before you start the Calibration Utility. The Calibration Utility prompts you for the location of the folder containing the export module.

If you use another version of Windows, your dialog boxes will look slightly different than those shown in this chapter.

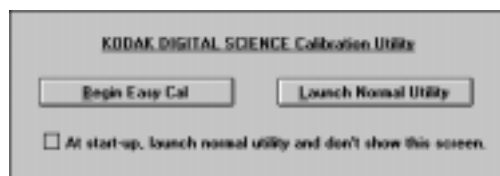
Starting in Windows 3.1x

1. Double-click on the *Kodak DS Calibration Utility* group icon in the Program Manager window.

The Kodak Calibration Utility window opens.

2. Double-click on the *Kodak DS Calibration Utility* icon.

A splash screen appears, then the Calibration Utility selection dialog appears.



NOTE: If this is the first time that the Calibration Utility has been run, or if there are no printers on the *Select Printer* drop-down list, or if the Preferences files have been deleted, you must select and open the export module for the printer that you want to calibrate.

3. Do one of the following:

- Click on the *Begin Easy Cal* button to start up Easy Cal.

Information about the Easy Cal calibration procedure is in “Using Easy Cal to Calibrate Your Printer” on page 1–6.

or

- Click on the *Launch Normal Utility* button to start up Normal Utility.

Information about the Normal Utility calibration procedure is in “Using Normal Utility to Calibrate Your Printer” on page 1–16.

NOTE: If you want to go directly to Normal Utility without the Calibration Utility selection dialog appearing each time you start the Calibration Utility, select the check box labeled *At start-up, launch normal utility and don't show this screen*. The corresponding check box (*Show Easy Cal selection screen at start-up*) in the Preferences dialog box (accessed from the File menu) is deselected.

To use Easy Cal from within Normal Utility, pull down the Easy-Cal menu and select *Begin...* or *Begin with Previous Settings...*

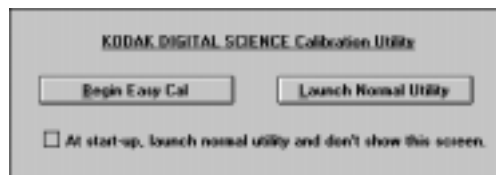
If you want the Calibration Utility selection box to appear when you start up the Calibration Utility, select the *Show Easy Cal selection screen at start-up* check box in the Preferences dialog box.

For more information about the options in the Preferences dialog box, refer to "Option Descriptions" on page 1–45.

Starting in Windows 95

1. Click on the *Start* button.
2. Select *Programs* on the Start menu.
3. Select *Kodak DS Calibration Utility* on the Programs menu.
4. Select *Kodak DS Calibration Utility* on the Kodak DS Calibration Utility menu.

A splash screen appears, then the Calibration Utility selection dialog appears.



NOTE: If this is the first time that the Calibration Utility has been run, or if there are no printers on the *Select Printer* drop-down list, or if the Preferences files have been deleted, you must select and open the export module for the printer that you want to calibrate.

5. Do one of the following:

- Click on the *Begin Easy Cal* button to start up Easy Cal.

Information about the Easy Cal calibration procedure is in “Using Easy Cal to Calibrate Your Printer” on page 1–6.

or

- Click on the *Launch Normal Utility* button to start up Normal Utility.

Information about the Normal Utility calibration procedure is in “Using Normal Utility to Calibrate Your Printer” on page 1–16.

NOTE: If you want to go directly to Normal Utility without the Calibration Utility selection dialog appearing each time you start the Calibration Utility, select the check box labeled *At start-up, launch normal utility and don't show this screen*. The corresponding check box (*Show Easy Cal selection screen at start-up*) in the Preferences dialog box (accessed from the File menu) is deselected.

To use Easy Cal from within Normal Utility, pull down the Easy-Cal menu and select *Begin...* or *Begin with Previous Settings...*

If you want the Calibration Utility selection box to appear when you start up the Calibration Utility, select the *Show Easy Cal selection screen at start-up* check box in the Preferences dialog box.

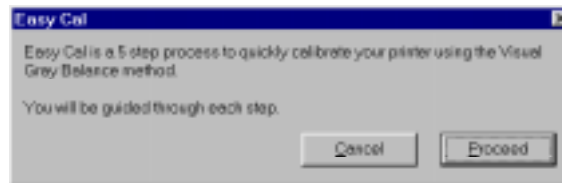
For more information about the options in the Preferences dialog box, refer to “Option Descriptions” on page 1–45.

Using Easy Cal to Calibrate Your Printer

The Easy Cal calibration procedure provides you with steps that guide you through the process of calibrating your printer using a Visual Gray Balance calibration.

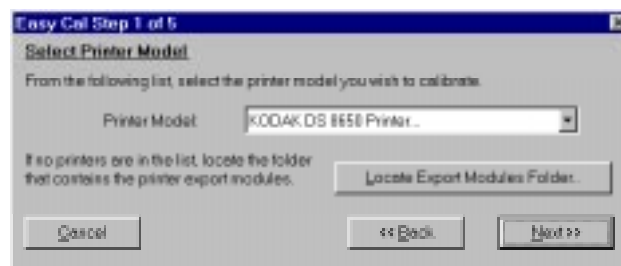
NOTE: The Easy Cal calibration procedure cannot be used to calibrate a printer that is using black-only ribbon.

When you click on the *Begin Easy Cal* button in the Calibration Utility selection dialog, the Easy Cal calibration procedure starts up and the following dialog box appears.



- Click on the *Proceed* button.

The Easy Cal Step 1 of 5 dialog box appears.



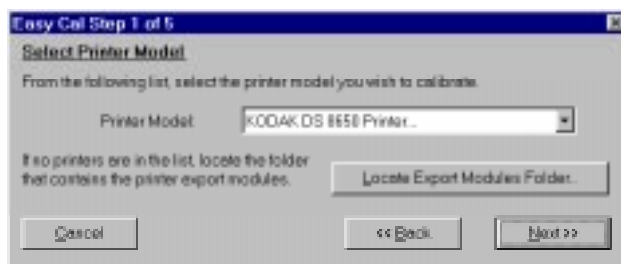
NOTE: Clicking on the *Cancel* button accesses Normal Utility.

Easy Cal Step 1

The Easy Cal Step 1 dialog box allows you to select a printer model to calibrate and find the corresponding export module.

NOTE: If you do not need to specify a different printer, click on the *Next>>* button in the Easy Cal Step 1 dialog box and go to “Easy Cal Step 2.”

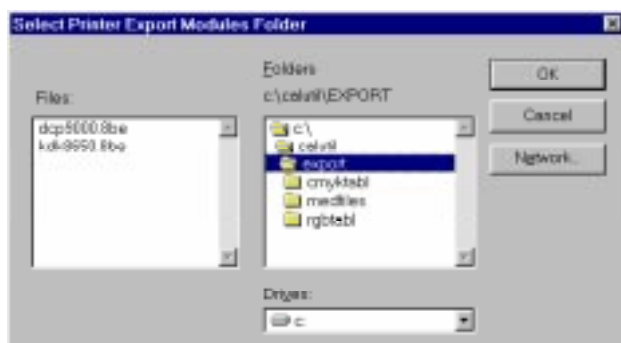
1. Select a printer on the *Printer Model* drop-down list.



NOTE: If there are no printers on the *Printer Model* drop-down list or the printer you want to calibrate does not appear on the list, you must find and select the export module for the printer that you want to calibrate.

2. Click on the *Locate Export Modules Folder...* button.

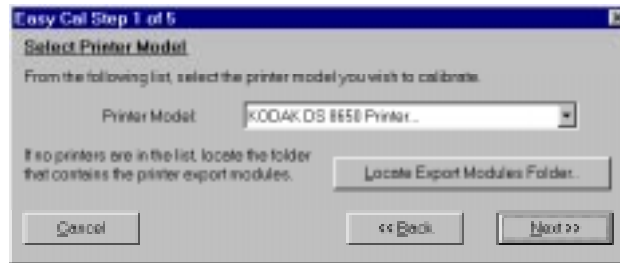
A selection box appears. This box shows the directory in which the Calibration Utility was installed. The name of the export module appears in the *Files* list.



3. Find and open the directory that contains the export module.

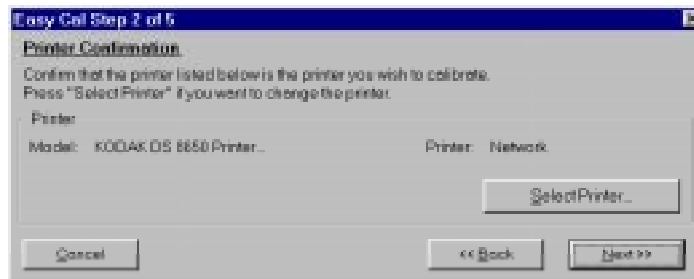
4. Click on the *OK* button.

You return to the Easy Cal Step 1 dialog box. The Calibration Utility now can find and use the export module so it can transfer data to the printer.



5. Click on the *Next >>* button.

The Easy Cal Step 2 dialog box appears.

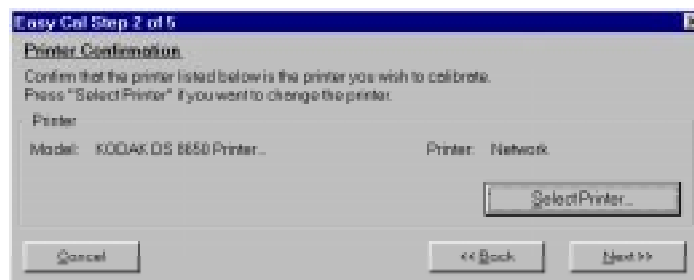


Easy Cal Step 2

The Easy Cal Step 2 dialog box allows you to specify a different printer to calibrate than the one that appears in the *Printer* box.

NOTE: If you do not need to specify a different printer, you can ignore the following steps and click on the *Next>>* button in the Easy Cal Step 2 dialog box and go to “Easy Cal Step 3.”

1. Click on the *Select Printer...* button.



The Select a Printer dialog box appears.

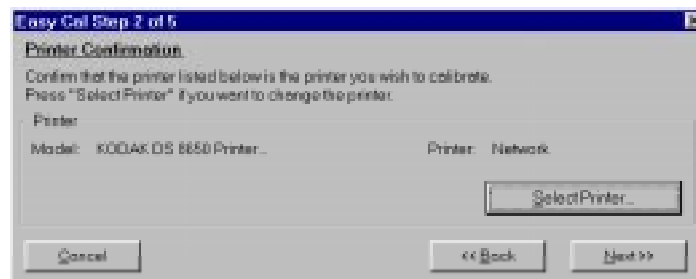


NOTE: Your Select Printer dialog box may appear different, depending on your printer export module.

If this is the first time that the Calibration Utility has been run or if the Preferences files have been deleted, you must locate an export module folder. At this time some export modules may require that you locate the necessary files.

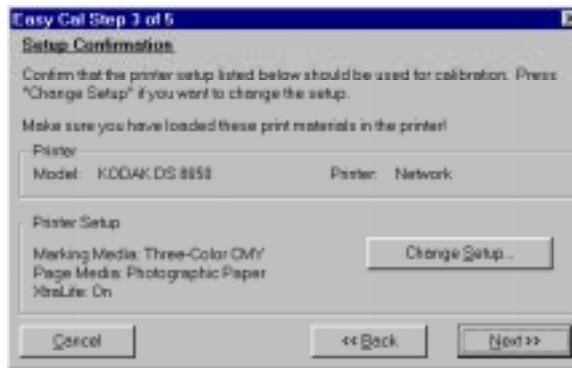
2. Click on the button for the port to which the printer is connected.
3. Click on the *OK* button.

You return to the Easy Cal Step 2 dialog box.



4. Click on the *Next >>* button.

The Easy Cal Step 3 dialog box appears.



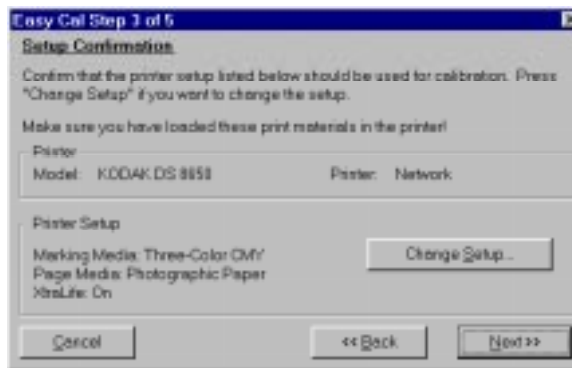
Easy Cal Step 3

The Easy Cal Step 3 dialog box allows you to specify a different printer media to calibrate than the one that appears in the *Printer Setup* box.

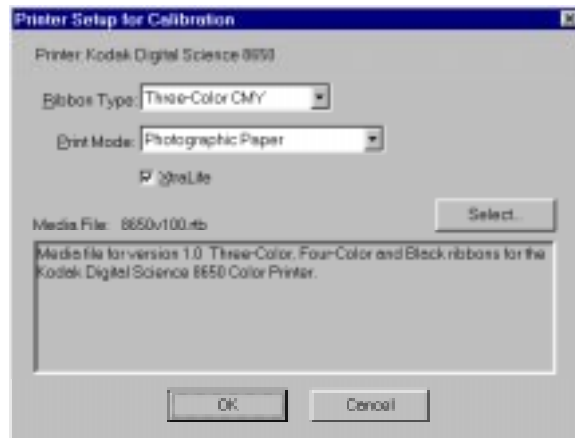
1. Make sure that the paper and media types for which you want to calibrate are loaded in the printer.

NOTE: If you do not need to specify a different printer media, you can ignore the following steps and click on the *Next>>* button in the Easy Cal Step 3 dialog box and go to “Easy Cal Step 4.”

2. Click on the *Change Setup...* button.



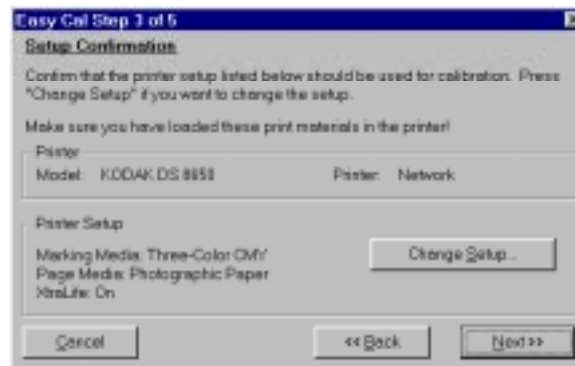
The Printer Setup for Calibration dialog box appears.



NOTE: Your Printer Setup for Calibration dialog box may appear different, depending on your printer export module.

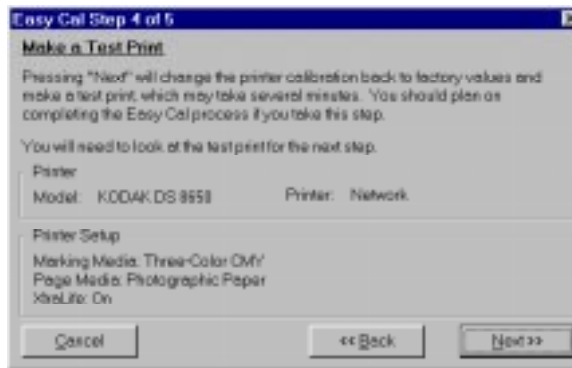
3. Make any necessary changes in the Printer Setup for Calibration dialog box.
4. Click on the *OK* button.

You return to the Easy Cal Step 3 dialog box.



5. Click on the *Next >>* button.

The Easy Cal Step 4 dialog box appears.

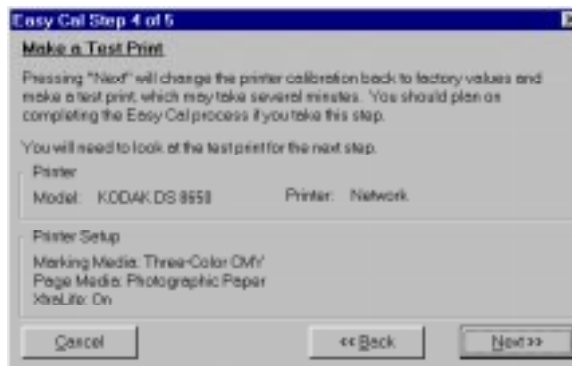


Easy Cal Step 4

The Easy Cal Step 4 dialog box contains printer and printer setup information that will be used for the test print that is created in this step.

NOTE: If the Easy Cal Step 4 dialog box does not contain printer and printer setup information, click on the <<Back button and click on the *Change Setup...* button.

1. Make sure that the *Printer* and *Printer Setup* information is correct.



NOTE: Clicking on the *Next>>* button sends the default table to the printer. The previous table is overwritten.

2. Click on the *Next >>* button.

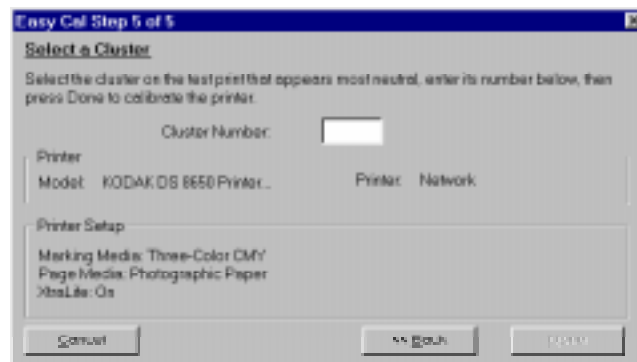
The default table is sent to the printer and the previous table is overwritten. The Send and Print dialog box appears.



NOTE: Your Send and Print dialog box may appear different, depending on your printer export module.

3. Click on the *Print* button.

Your computer begins processing information. This may take a few minutes. The calibration test print is printed on the specified printer. The Easy Cal Step 5 dialog box appears.



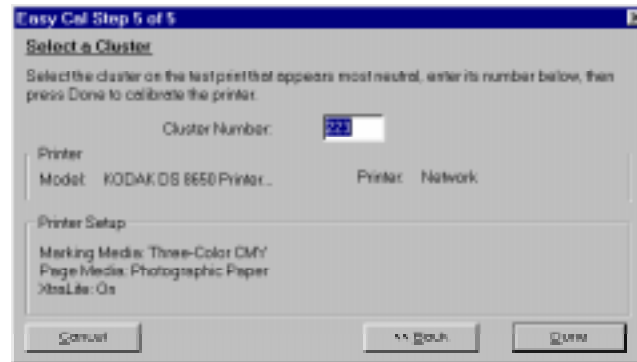
Easy Cal Step 5

Use the test print to calibrate your printer in the Easy Cal Step 5 dialog box.

1. Look at the test print and decide which grayscale cluster appears the most neutral gray.

NOTE: If you want to print another test print, click on the <<Back button to return to the Easy Cal Step 4 dialog box.

2. Type the number of the most neutral grayscale cluster in the *Cluster Number* text box.

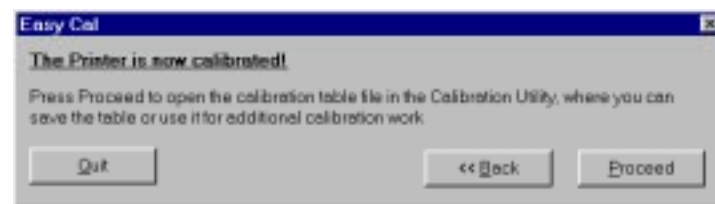


NOTE: If you want to print an updated test print, you can click on the <<Back button to return to the Easy Cal Step 4 dialog box.

If cluster number 225 on the updated test print is the most neutral gray, then the calibration is successful. Type **225** in the *Cluster Number* text box and go to step 3.

3. Click on the *Done* button.

The printer calibration begins. When the calibration is complete, the following dialog box appears.



4. Do one of the following:

- If you do not want to make another test print and you do not want to save the calibration table, click on the *Exit* button to quit the Calibration Utility.

or

- If you want to save the calibration table, click on the *Proceed* button to access a document window. Refer to "Using the Calibration Document Window" on page 1–28.

Saving Your Calibration Table

You may want to save the calibration table you just created to use as a starting point for later calibrations.

- Pull down the File menu and select *Save* to save changes to the current calibration table.
- Pull down the File menu and select *Save As* to access a selection box in which you can specify a new name and location for the current calibration table.

Using Normal Utility to Calibrate Your Printer

The Normal Utility calibration procedure allows you to create a new calibration document or start from a calibration document that was previously created and saved.

When you click on the *Launch Normal Utility* button in the Calibration Utility selection box, the Normal Utility calibration procedure starts up and the Calibration Utility window opens.

NOTE: If this is the first time that the Calibration Utility has been run, or if there are no printers on the *Select Printer* drop-down list, or if the Preferences files have been deleted, you must select and open the export module for the printer that you want to calibrate.

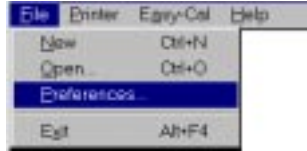
You can either create a new calibration table or open an existing one to calibrate your printer.

- Information about creating a new calibration table is in “Creating a New Calibration Document” on page 1–19.
- Information about using an existing calibration table is in “Opening an Existing Calibration Table” on page 1–26.

Setting Preferences

You can specify the folders that contains the export module and the import module (used for densitometer settings) in the Preferences dialog box.

1. Pull down the File menu and select *Preferences*.



The Preferences dialog box appears.

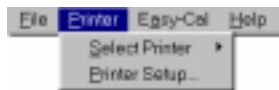


2. Click on the *Select* button next to "Printer Export Modules Folder."
A selection box appears.
3. Find and open the folder in which the export module is located.
4. Click on the *OK* button.
You return to the Preferences dialog box.
5. Click on the *Select* button next to "Densitometer Import Modules Folder."
A selection box appears.
6. Find and open the folder in which the import module is located.
7. Click on the *OK* button.
You return to the Preferences dialog box.
8. Click on the *OK* button.
Your selections are saved.

Selecting and Setting Up a Printer

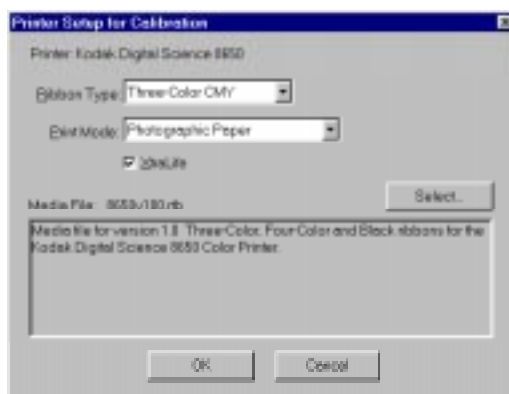
Select a printer and specify the printer media before you start a calibration.

1. Pull down the Printer menu.



2. Choose *Select Printer* and highlight the printer you want to calibrate.
3. Pull down the Printer menu and choose *Printer Setup*.

The Printer Setup for Calibration dialog box appears.



NOTE: The Printer Setup for Calibration dialog box may appear different, depending on the selected printer.

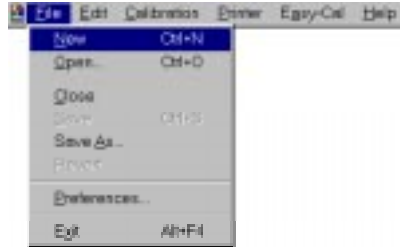
4. Select the media combination(s) for which you are calibrating.
5. Click on the *OK* button.

The Printer Setup for Calibration dialog box closes.

Creating a New Calibration Document

You can either create a new calibration document or open an existing one to calibrate your printer.

1. Pull down the File menu and select *New*.



The Calibration Table dialog box appears.



Ribbon and paper type information may not appear in the *Printer Setup* box if you have not first used the Printer menu's *Printer Setup...* option.

If the correct paper and media types do not appear, refer to the previous section, "Selecting and Setting Up a Printer." If the correct paper and media types appear, refer to "Selecting a Starting Point for the Calibration Document" on page 1–20.

NOTE: The *Read Current Table From Printer* radio button will not be available if the printer cannot return this information (for example, many printers connected via parallel will have this option deselected).

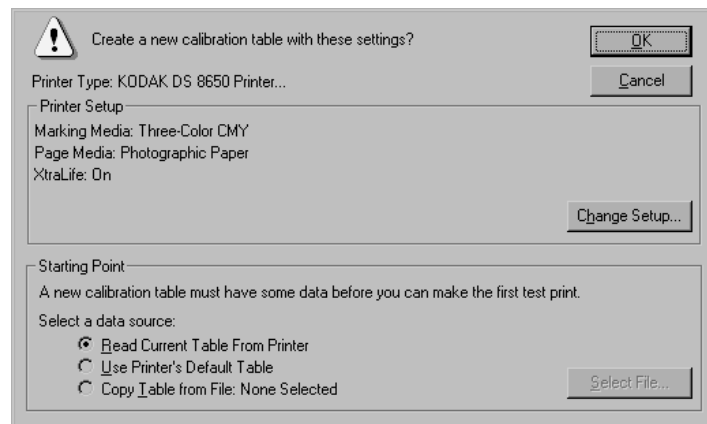
Selecting a Starting Point for the Calibration Document

This section describes how to select a starting point (base file) for the calibration document. There are three ways to access a base file:

- *Read Current Table From Printer*—uses the printer's current table (refer to "Using the Printer's Current Calibration Table as the Starting Point" on this page).
- *Use Printer's Default Table*—uses the printer's default table (refer to "Using the Printer's Default Calibration Table as the Starting Point" on page 1-22).
- *Copy Table from File*—uses a previously created and saved calibration table (refer to "Using an Existing Calibration Table as the Starting Point" on page 1-23).

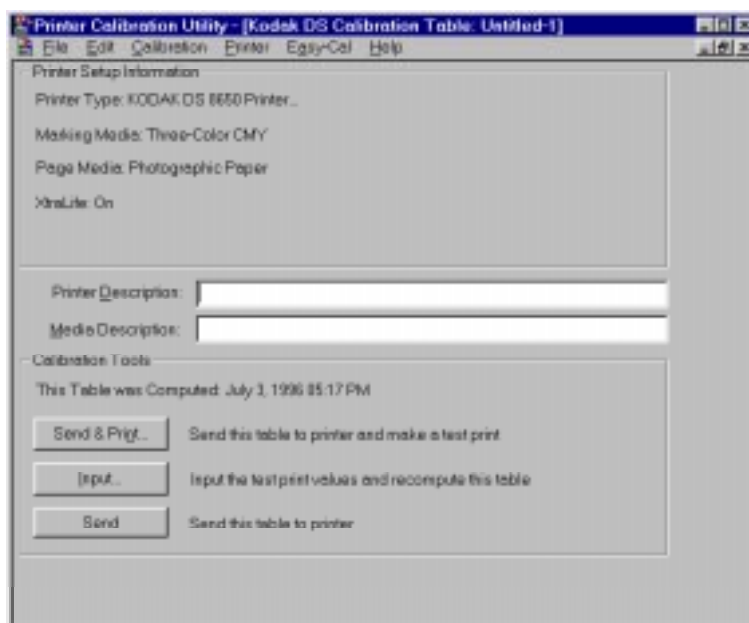
Using the Printer's Current Calibration Table as the Starting Point

1. Select the *Read Current Table From Printer* radio button in the *Starting Point* box.



2. Click on the *OK* button.

A Calibration Document window appears.



3. Go to "Using the Calibration Document Window" on page 1–28.

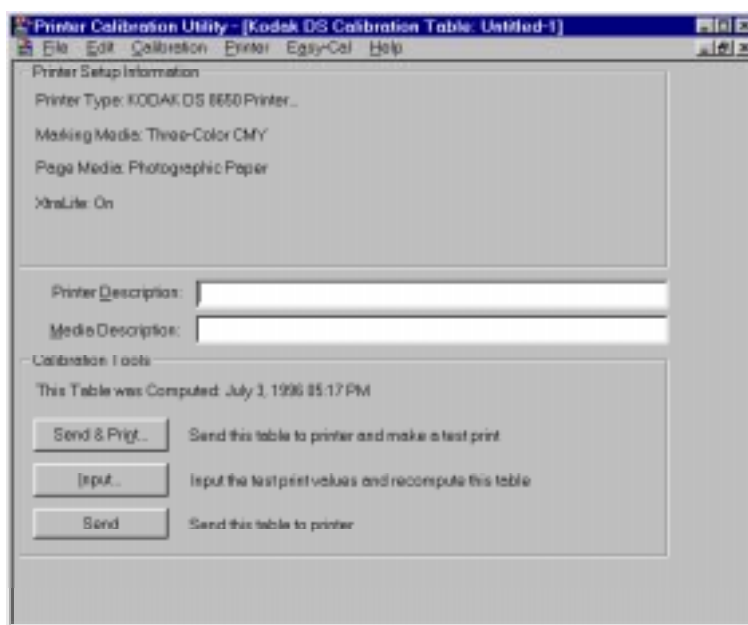
Using the Printer's Default Calibration Table as the Starting Point

1. Select the *Use Printer's Default Table* radio button in the *Starting Point* box.



2. Click on the *OK* button.

A Calibration Document window appears.



3. Go to "Using the Calibration Document Window" on page 1-28.

Using an Existing Calibration Table as the Starting Point

You can follow the steps below only if you have previously created and saved a calibration table. If you are using the Calibration Utility for the first time, no calibration tables exist yet for use as a starting point.

The table you select to use as a starting point does not contain printer setup information. Follow the instructions in “Selecting and Setting Up a Printer” on page 1–18 to specify information about the printer paper and media.

1. Select the *Copy Table from File*: radio button in the *Starting Point* box.



2. Click on the *Select File...* button.

A file selection dialog box appears.



3. Find and open the directory that contains the calibration table you want to use as the starting point for your new table.
4. Select the calibration table you want to copy.

NOTE: The data in the table selected as a starting point is specific to the paper and media types specified when the table was created. You cannot select documents for the incorrect paper and ribbon type.

The files you can select are files created by the Calibration Utility or any file that has a *.kcu* extension. However, you can only choose tables that are configured for that particular printer and media.

5. Click on the *Open* button.

The file selection dialog box closes. The name of the selected calibration table appears after the *Copy Table from File:* radio button.



6. Click on the *OK* button.

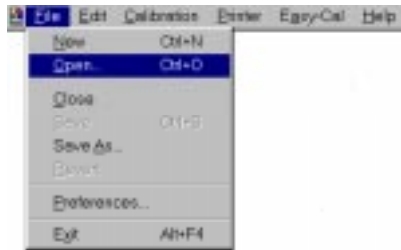
A Calibration Document window appears.



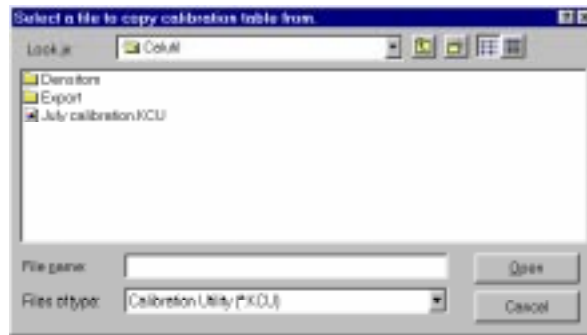
7. Go to "Using the Calibration Document Window" on page 1–28.

Opening an Existing Calibration Table

1. Pull down the File menu and select *Open*.

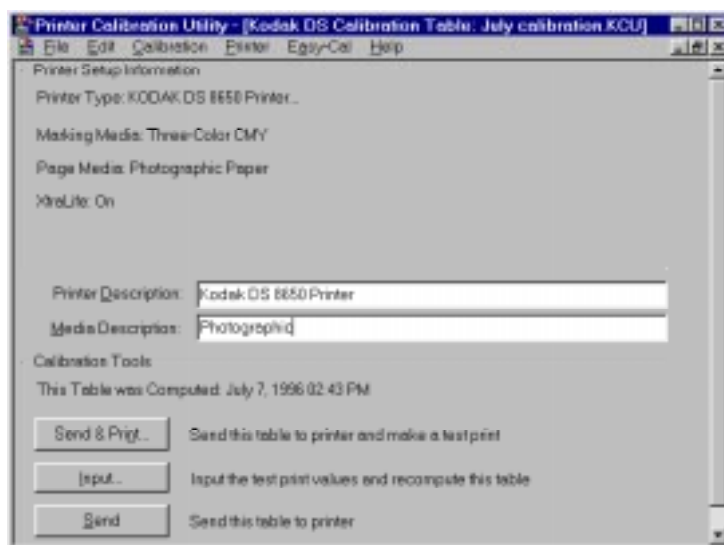


A file selection dialog box appears.



2. Find and open the directory that contains the calibration table you want to use.
3. Select the calibration table you want to use.
4. Click on the *Open* button.

A Calibration Document window appears.

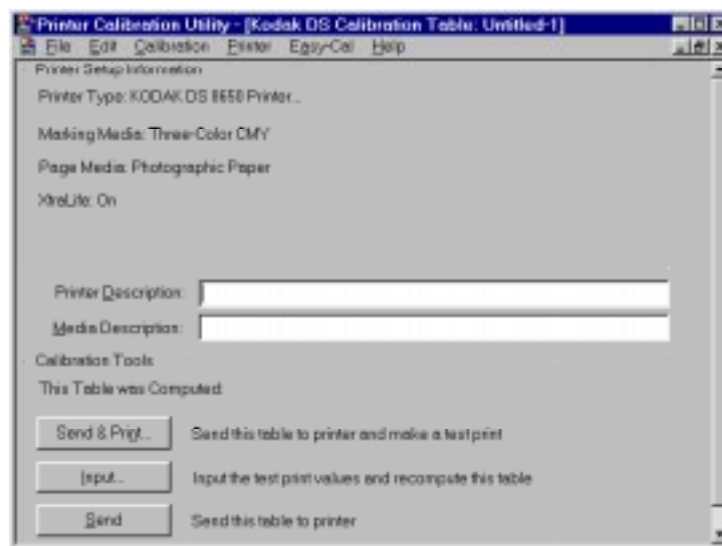


5. Go to "Using the Calibration Document Window" on page 1–28.

Using the Calibration Document Window

Use the Calibration Document window to set up and run Visual Gray Balance, Visual Linearity, and Densitometer calibrations.

1. Make sure that the information in the *Printer Setup Information* box is correct and make sure that you are creating a calibration table for the media you want to use.



2. Type information about the printer you are calibrating in the *Printer Description* text box.
3. Type information about the media combination for which you are calibrating in the *Media Description* text box.

NOTE: Entries in the *Printer Description* and *Media Description* text boxes are optional and do not appear on the test print.

You can calibrate your printer. Refer to "Calibrating the Printer" on page 1–29.

NOTE: If you are using black-only media, you cannot use the Visual Gray Balance calibration method to calibrate your printer. You must go directly to the Visual Linearity calibration procedure.

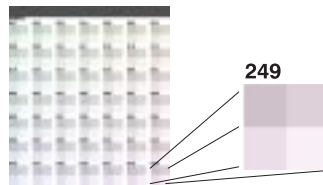
Calibrating the Printer

You can now calibrate your printer by running the Visual Gray Balance and Visual Linearity calibration procedures.

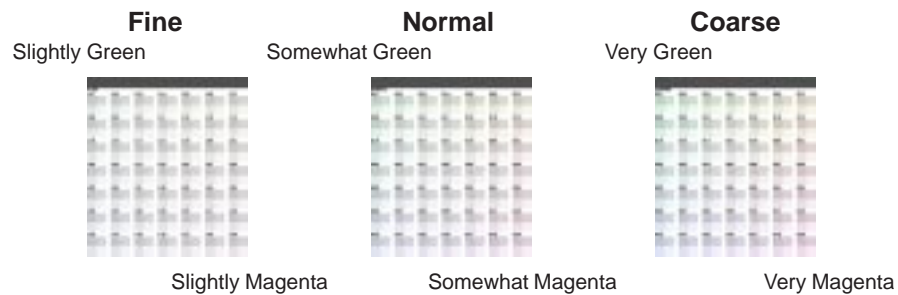
If you have a densitometer, you can run just the Densitometer calibration procedure. You do not have to do Visual Gray Balance and Visual Linearity calibrations. Refer to "Running a Densitometer Calibration" on page 1-40.

Visual Gray Balance

Visual Gray Balance calibrates your printer so it produces a neutral gray. The Calibration Utility allows you to select from three Visual Gray Balance calibration prints. Each of these prints presents 49 numbered grayscale clusters. Each cluster is made up of four boxes of varying densities. A Visual Gray Balance calibration print looks similar to the following example.



The clusters on the three prints include a range of colors. Clusters in the upper left corner will have a green hue. Clusters in the lower right corner will have a magenta hue. Three different calibration prints allow you to choose the degree of color shift.



Fine—offers the least degree of difference between clusters. This print is useful when it is difficult to choose between clusters on the Normal calibration print.

For example, you printed a Normal print and you find that the most neutral-looking clusters are next to each other, but one still looks slightly green while the other still looks slightly magenta. You can print a Fine calibration print to get more choices within a smaller range of colors.

Normal—offers a moderate degree of difference between clusters. The amount of correction in this print is appropriate for most calibration jobs.

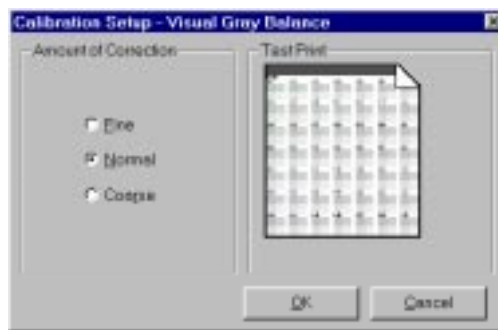
Coarse—offers the greatest degree of difference in clusters. This print is useful when neutral areas in your prints appear very green or very magenta.

Running a Visual Gray Balance Calibration

1. Pull down the Calibration menu and select *Visual Gray Balance*.
2. Pull down the Calibration menu and select *Setup Visual Gray Balance...*



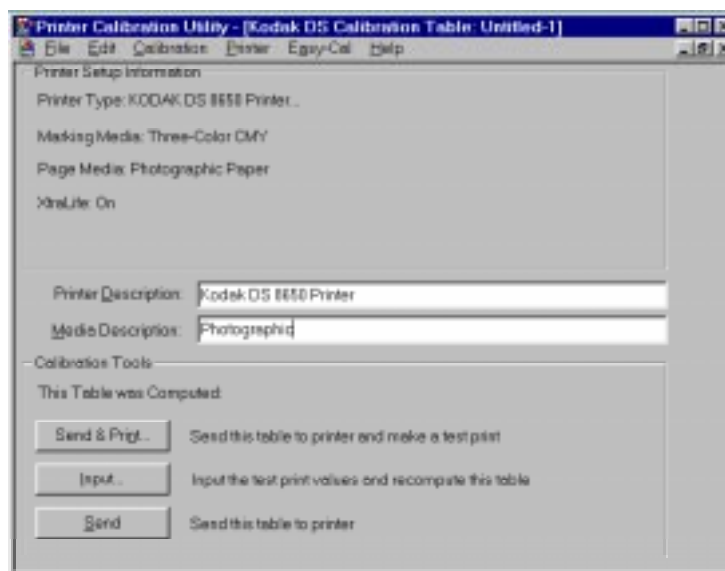
The Calibration Setup – Visual Gray Balance dialog box opens.



3. Select a radio button in the *Amount of Correction* box.

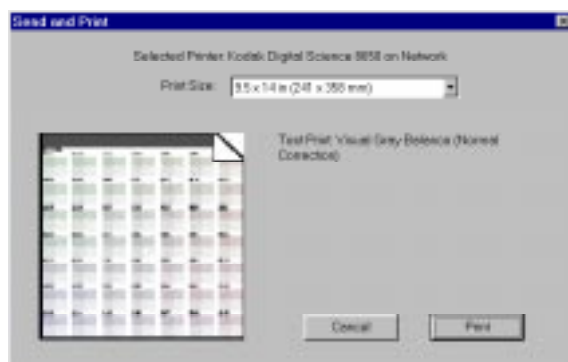
4. Click on the *OK* button.

You return to the Calibration Document window.



5. Click on the *Send & Print* button.

The Send and Print dialog box appears.



NOTE: Your Send and Print dialog box may appear different, depending on your printer export module.

6. Click on the *Print* button.

You return to the Calibration Document window. The calibration test print is printed on the specified printer.



7. View the calibration test print and determine which cluster appears the most neutral.

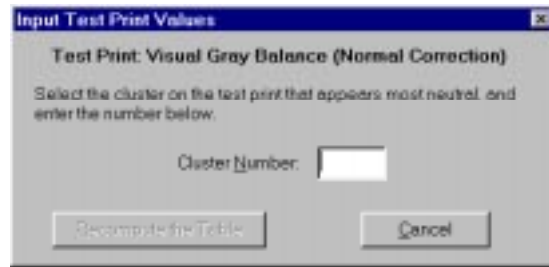
If the Visual Gray Balance most-neutral cluster number on the test print ends in 25, the printer is already calibrated. You should now perform a Visual Linearity calibration.

If the Visual Gray Balance number on the test print does not end in 25, you must recalibrate the printer to the most neutral cluster number.

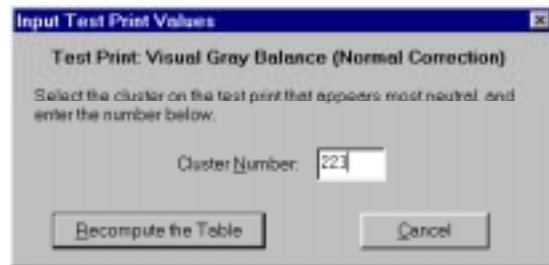
NOTE: If you enter a value that ends in 25, the calibration table does not change.

8. Click on the *Input* button.

The Input Test Print Values dialog box appears.

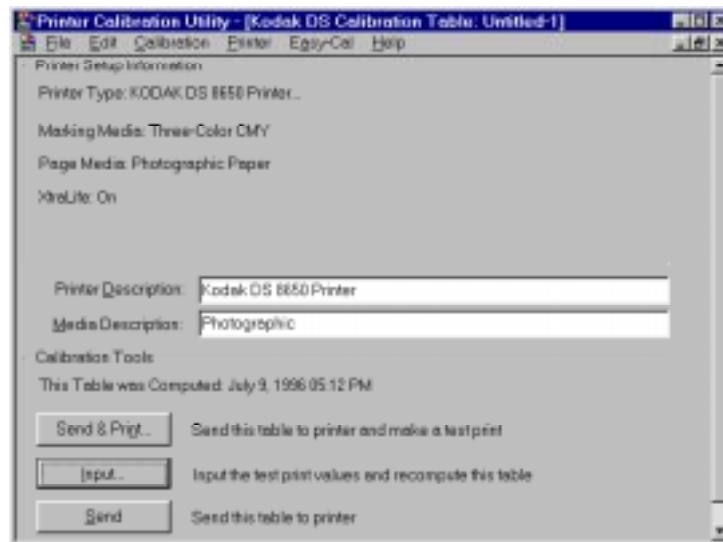


9. Type the number of the most-neutral cluster in the *Cluster Number* box.



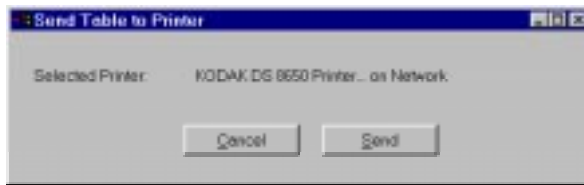
10. Click on the *Recompute the Table* button.

The calibration table data is updated and the Calibration Document window appears.



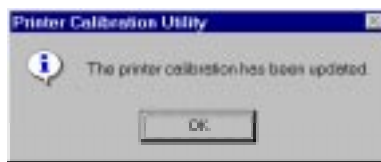
11. Click on the *Send* button if you are satisfied with the neutral in the cluster you selected and you do not want to look at another calibration print.

A confirmation box appears.



12. Click on the *Send* button.

The recomputed table is sent to the printer and the following message appears.



13. Click on the *OK* button.

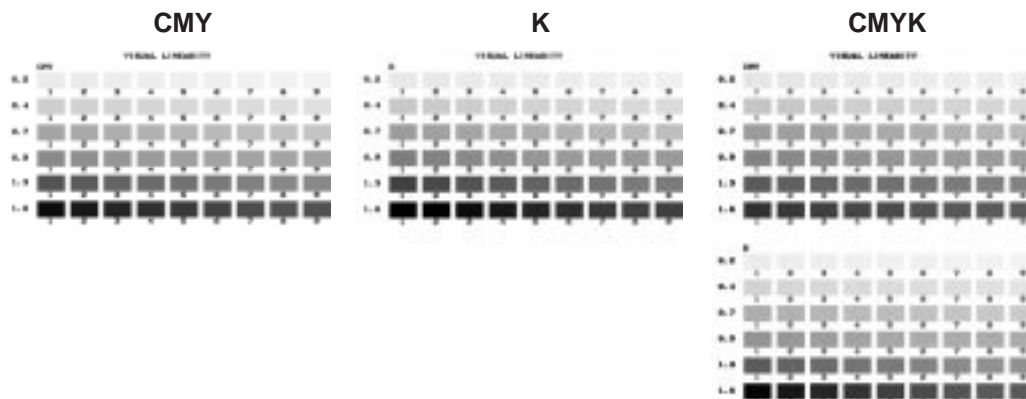
The calibration table is computed using the specified values and you return to the Calibration Document window. You should now perform a Visual Linearity calibration.

NOTE: You should make another test print to verify your input value adjustments.

Visual Linearity

Visual Linearity calibrates your printer so it produces the correct shading (lightness/darkness).

Use the Linearity Reference Card to select a cluster for each of the six density ranges. Visual Linearity calibration prints look similar to the following examples.



Using the Linearity Reference Card

The Linearity Reference Card is included with the Calibration Utility. Use this Reference Card for performing Visual Linearity calibrations. Following are instructions for using the Reference Card.

1. Lay the Linearity Reference Card with the name at the top on the first row of the calibration print.

NOTE: It may not be possible to find a cluster in which all six gray levels exactly match the Linearity Reference Card. Select the cluster that appears to be the closest match.

2. Slide the Linearity Reference Card across each patch in the row and determine which of the nine patches in the row most closely matches the darkness on the Reference Card.

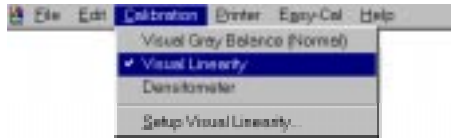
NOTE: Match the darkness on the Reference Card, not the color.

3. Repeat step 2 for each row on the calibration print.

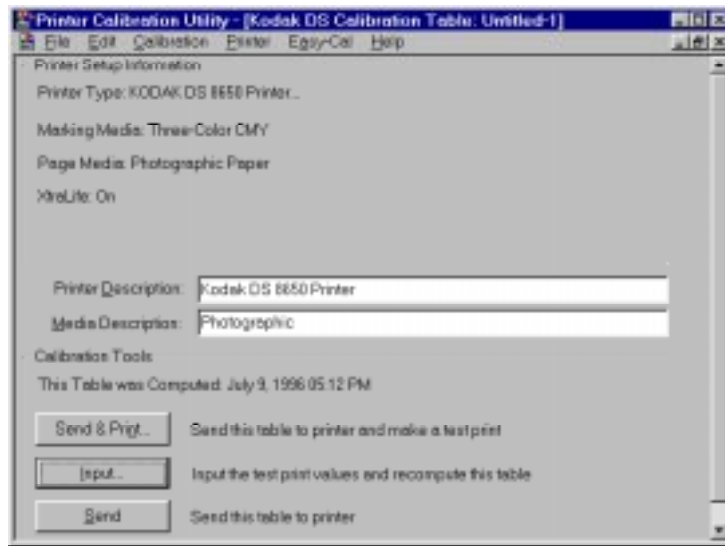
Running a Visual Linearity Calibration

After you have run a calibration using the *Visual Gray Balance* option, use the *Visual Linearity* option to recompute the current calibration table using values from the test print.

1. Pull down the Calibration menu and select *Visual Linearity*.

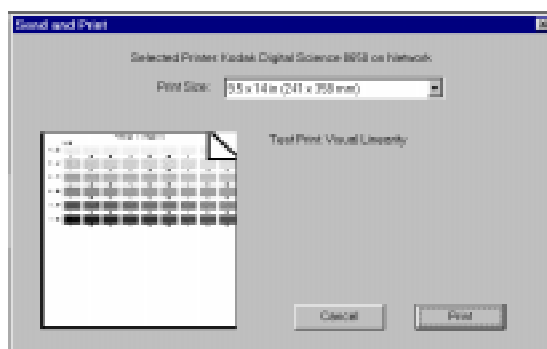


You return to the Calibration Document window.



2. Click on the *Send & Print* button.

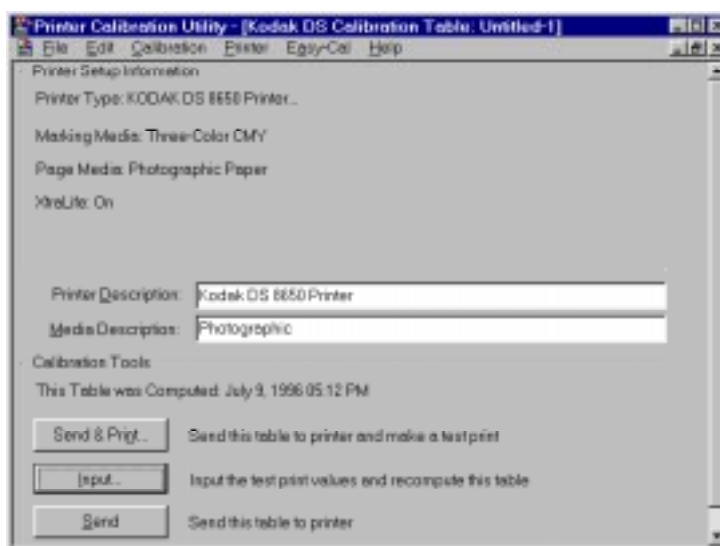
The Send and Print dialog box opens.



NOTE: Your Send and Print dialog box may appear different, depending on your printer export module.

3. Click on the *Print* button.

You return to the Calibration Document window. The calibration test print is printed on the specified printer.



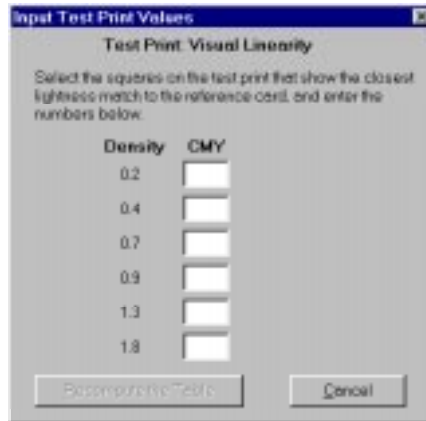
4. Use the Linearity Reference Card to select a box number for each of the six density ranges.

If all of the Visual Linearity numbers on the test print are box number 5, the printer is already calibrated. You can close the Calibration Utility.

If the Visual Linearity numbers on the test print are not all box number 5, you must recalibrate the printer. Go to step 5.

5. Click on the *Input* button.

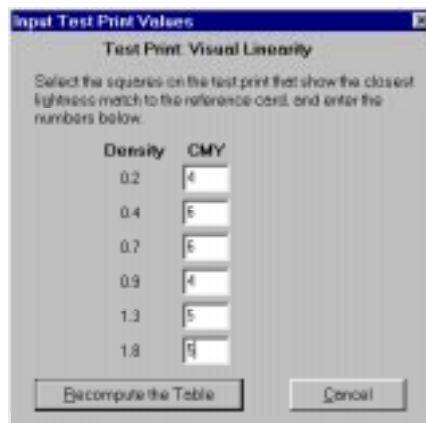
The Input Test Print Values dialog box opens.



The dialog box is titled "Input Test Print Values" and contains a section "Test Print: Visual Linearity". It instructs the user to "Select the squares on the test print that show the closest lightness match to the reference card, and enter the numbers below:". There is a table with two columns: "Density" and "CMY". The "Density" column has values 0.2, 0.4, 0.7, 0.9, 1.3, and 1.8. The "CMY" column has six empty text boxes for input. At the bottom, there are two buttons: "Recompute the Table" and "Cancel".

Density	CMY
0.2	
0.4	
0.7	
0.9	
1.3	
1.8	

6. Type in the values you select from the test print in the text boxes.



The dialog box is the same as the previous one, but now the "CMY" column has values entered in the text boxes: 4, 5, 5, 4, 5, and 5. The "Recompute the Table" and "Cancel" buttons are still at the bottom.

Density	CMY
0.2	4
0.4	5
0.7	5
0.9	4
1.3	5
1.8	5

7. Click on the *Recompute the Table* button.

The calibration table is computed using the specified values and the Calibration Document window appears.

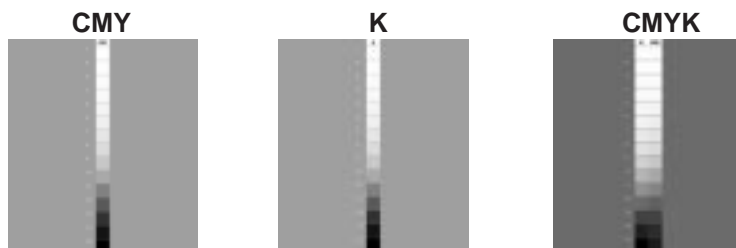
8. Click on the *Send* button to send the table to the printer.

Densitometer

A Densitometer calibration corrects the printer's response based on the densitometer reading for selected patches. If you have a densitometer, you do not need to run Visual Gray Balance and Visual Linearity calibrations. You only have to run the Densitometer calibration.

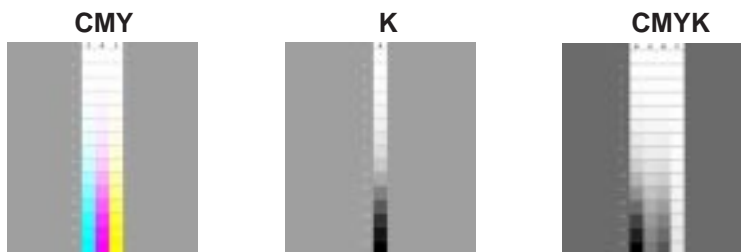
Print a test print and read it with a densitometer. There are two kinds of densitometer prints: process and separation. The kind of print you get depends on your printer. Densitometer calibration prints look similar to the following examples.

Process Densitometer Prints



example: from a Kodak XLS 8600 Printer or *Kodak Digital Science™* 8650 Printer

Separations Densitometer Prints



example: from a *Kodak Digital Science™* DCP 9000 Printer

NOTE: Separation prints have separate individual colors for each of the cyan, magenta, and yellow planes. Process prints combine the cyan, magenta, and yellow into a single gray column. Black is always a separate column.

Using a densitometer, you enter the density results for each of the patches in the Densitometer Input Test Print Values dialog box. In each case, you always input the visual component for the patch.

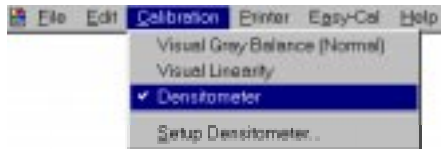
For separations prints, enter the "C" component for the cyan patches, the "M" component for the magenta patches, and the "Y" component for the yellow patches.

For process prints, enter the "C," "M," and "Y" components for each of the CMY patches.

Running a Densitometer Calibration

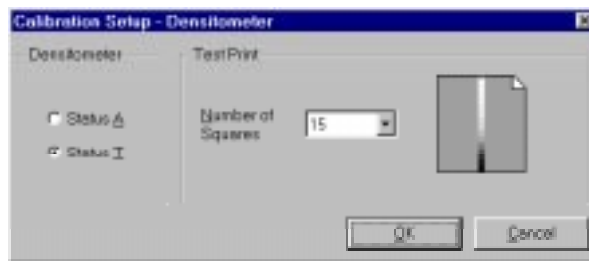
If you have a densitometer, you can run the Densitometer calibration instead of the Visual Gray Balance and Visual Linearity calibrations.

1. Set up your densitometer.
2. Pull down the Calibration menu and select *Densitometer*.



3. Pull down the Calibration menu and select *Setup Densitometer....*

The Calibration Setup – Densitometer dialog box appears.



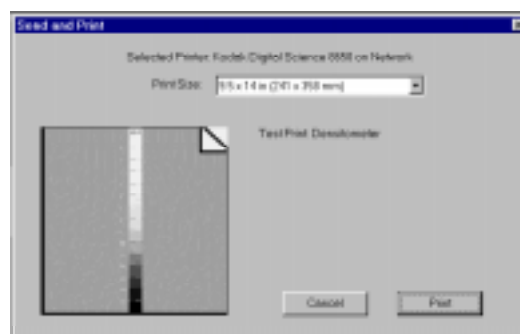
4. Select a densitometer status in the *Densitometer* box.
5. Pull down the *Number of Squares* menu in the *Test Print* box and select the number of squares in your test print.
6. Click on the *OK* button.

You return to the Calibration Document window.



7. Click on the *Send & Print* button.

The Send and Print dialog box appears.



NOTE: Your Send and Print dialog box may appear different, depending on your printer export module.

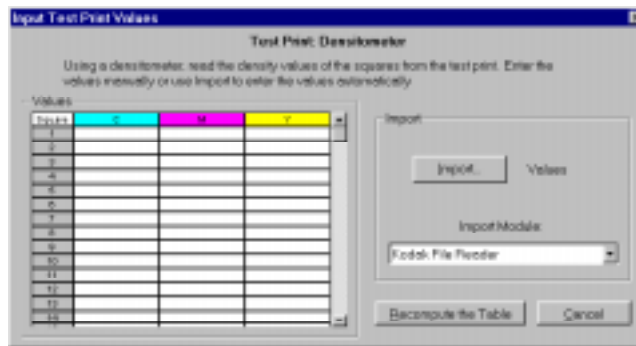
8. Click on the *Print* button.

You return to the Calibration Document window. The calibration test print is printed on the specified printer.



9. Click on the *Input* button.

The Input Test Print Values dialog box appears.



One, three, or four Density Value columns appear in the Input Test Print Values dialog box, depending on the calibration your printer requires (for black ribbon, three-color ribbon, or four-color ribbon).

The number of Density Value rows is determined by the selection in the *Number of Squares* menu (15 or 38).

Valid characters in this dialog box include numbers from 0 to 9, periods (.), and commas (,). The valid range is 0 to 3.999 (0 to 3,999). Move from cell to cell using your keyboard's arrow keys. You can copy and paste any group of contiguous fields in a rectangular pattern.

10. Type the test print values in the text boxes.

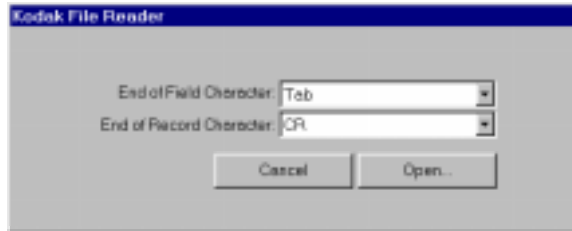
NOTE: You can import densitometer data automatically with an import module. If your densitometer has an associated import module, the densitometer readings will be imported directly into the dialog box. Using the Kodak File Reader, you can read in a file of data and specify the end of Field and End of Record characters. For more information, refer to "Import" on page 1-44.

11. Click on the *Recompute the Table* button.

The calibration table is computed using the specified values and the Calibration Document window appears.

Import

The selected import module opens a dialog box when you click on the *Import* button in the Densitometer — Input Test Print Values dialog box. For the Kodak File Reader, the following dialog box appears when you click on the *Import* button.



End of Field Character—specify the end-of-field character used in your densitometer file: “space,” “comma,” “tab,” “CR” (carriage return), “CR-LF” (carriage return/line feed), “LF” (line feed), and “Semi-colon.”

End of Record Character—specify the end-of-record character used in your densitometer file: “space,” “comma,” “tab,” “CR” (carriage return), “CR-LF” (carriage return/line feed), “LF” (line feed), and “Semi-colon.”

Open—the *Open* button allows you to find and import the densitometer file with the values you want to use in the Input Test Print Values dialog box.

Option Descriptions

This section describes the Calibration Utility menu and dialog box options.

File Menu

This section describes the features on the File pulldown menu.



New—accesses the Calibration Document window so you can select options for the current printer setup.

Open—accesses a file selection box so you can select an existing calibration table from which to start.

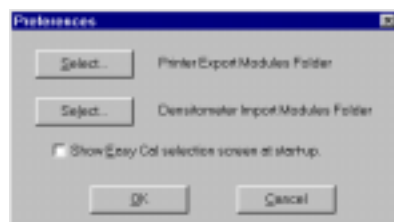
Close—closes the current calibration document.

Save—saves changes to the current calibration document. When you name a calibration document, you may want to include characters that indicate the selected media types. Saving a document this way allows you to select it later to use as a starting point for a new calibration document.

Save As...—accesses a dialog box in which you can specify a new name and location for the current calibration settings. When you name a calibration document, you may want to include characters that indicate the selected media types. Naming a document this way allows you to select it later to use as a starting point for a calibration document.

Revert—returns a calibration document to its original state. All recomputations are discarded.

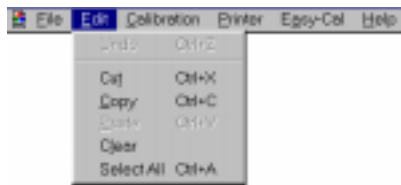
Preferences...—accesses a dialog box that allows you to specify the folder containing the export module and the folder containing the import module (used for densitometer settings).



Exit—exits the Calibration Utility.

Edit Menu

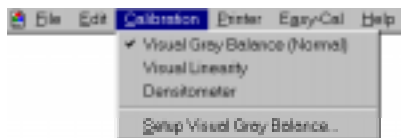
The Edit menu is enabled only when a Calibration Document window is open.



The options in the Edit menu are enabled only when you enter text in the *Printer Description* and *Media Description* boxes.

Calibration Menu

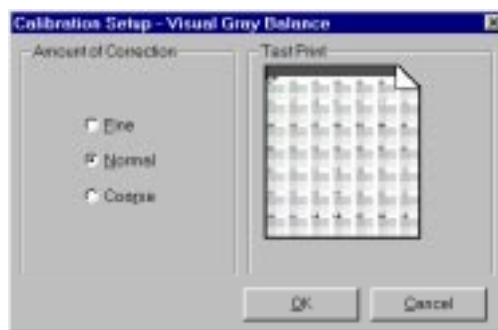
The Calibration menu is enabled when a Calibration Document window is open. You can choose to calibrate based on your input to the Visual Gray Balance, Visual Linearity, and Densitometer dialog boxes.



Calibration Setup — Visual Gray Balance

This dialog box allows you to specify the degree of correction to apply with the current calibration table.

NOTE: If you are using black-only media, you cannot use the Visual Gray Balance calibration method to calibrate your printer.



Amount of Correction

The *Amount of Correction* radio buttons allow you to specify the degree of difference between neutrals the calibration print will present.

Fine—the calibration print offers the least degree of difference in neutrals between the cluster in the upper left corner and the cluster in the lower right corner. The cluster in the upper left corner is only slightly green and the cluster in the lower right corner is only slightly magenta.

Select “Fine” to get the smallest hue range. This means that the hue differences between clusters is small so you can fine-tune by choosing between very similar neutrals.

Normal—the calibration print offers a moderate degree of difference in neutrals between the cluster in the upper left corner and the cluster in the lower right corner. The cluster in the upper left corner is somewhat green and the cluster in the lower right corner is somewhat magenta.

Select “Normal” to get a larger hue range than “Fine.” This means that the hue differences between clusters is slightly larger and adjacent clusters are less similar.

Coarse—the calibration print offers the greatest degree of difference in neutrals between the cluster in the upper left corner and the cluster in the lower right corner. The cluster in the upper left corner is distinctly green and the cluster in the lower right corner is distinctly magenta.

Select “Coarse” to get the largest hue range. This means that the hue differences between clusters is easily discernible and adjacent clusters are distinctly different.

Calibration Setup — Visual Linearity

There is no functionality for this option at this time.

Calibration Setup — Densitometer

This dialog box allows you to use values from a densitometer text table to recompute the calibration table.



NOTE: Make sure that your densitometer is calibrated before you try to calibrate your printer with the densitometer values.

Densitometer

The *Densitometer* radio buttons allow you to specify what type of density data (*Status A* or *Status T*) your densitometer provides. The Calibration Utility calculates the table data using the density type that the export module needs for the current calibration slot.

NOTE: Depending on the export module and settings, one of these options may not be available. For example, *Status A* is not available for the *Kodak Digital Science™* DCP 9000 Printer.

Test Print — Number of Squares

The *Number of Squares* menu in the *Test Print* box allows you to specify the number of squares (15 or 38) in your test print.

Printer Menu

The Printer menu allows you to select a printer or set up the printer from the menu bar.



Select Printer—a menu with the printer selections for your system appears.

Printer Setup...—the Printer Setup for Calibration dialog box appears so you can make changes for the selected printer.

Easy-Cal Menu

The Easy-Cal menu allows you to start the Easy Cal calibration procedure from the menu bar.



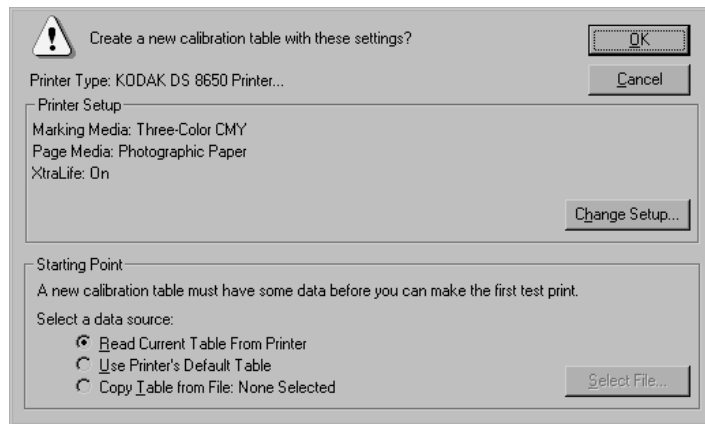
Begin...—the Easy Cal calibration procedure starts up.

Begin with Previous Settings...—the Easy Cal Step 4 dialog box appears.

NOTE: The Easy Cal calibration procedure cannot be used to calibrate a printer that is using black-only ribbon.

Calibration Table Dialog Box

Pull down the File menu and select *New* to access a dialog box that allows you to create a new calibration table.



Printer Setup

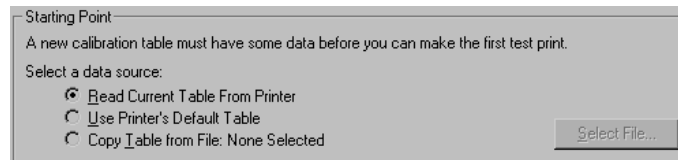
The *Printer Setup* box lists information about the ribbon and paper type for which the printer will be calibrated. Click on the *Change Setup* button to change the information that appears.



Change Setup—accesses the Printer Setup for Calibration dialog box so you can select options that match the media in the printer you are calibrating.

Starting Point

The *Starting Point* box allows you to select the data that will act as a base for the new calibration table.

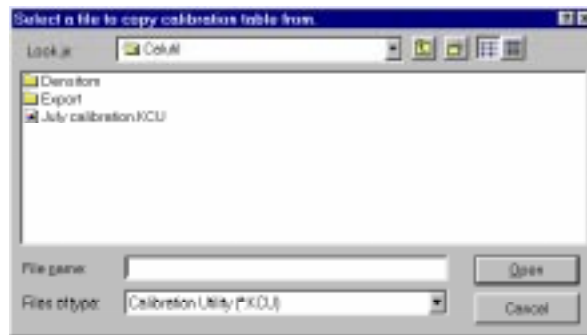


Read Current Table From Printer—allows you to retrieve and begin with the printer's current table. Once the table is loaded, you can edit it and recalibrate the printer. This option is not always available as a starting point.

Use Printer's Default Table—default printer data acts as the starting point for the new calibration document.

Copy Table from File—the calibration table you select with the *Select File* button acts as the starting point for the new calibration document.

Select File—opens a selection box so you can choose an existing calibration document from which to start.



OK

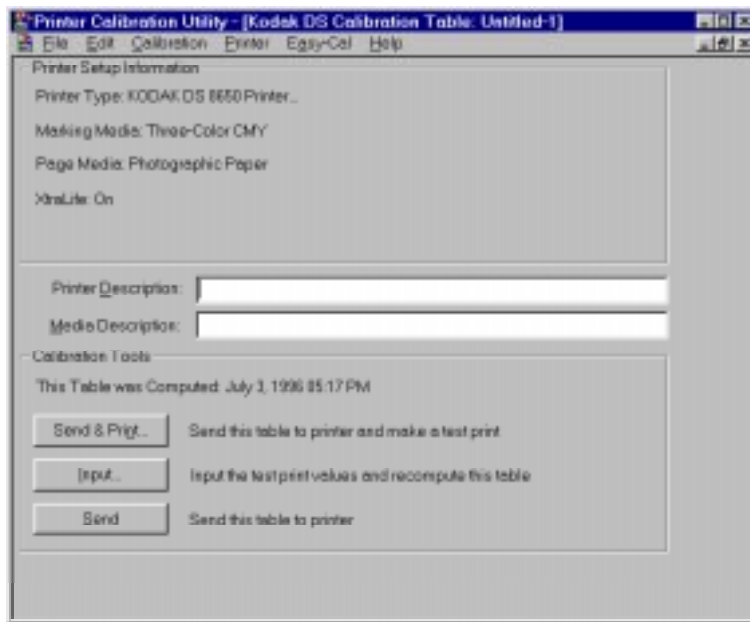
The *OK* button closes the dialog box and opens a Calibration Document window. Refer to "Calibration Document Window" on page 1–52 for more information.

Cancel

The *Cancel* button closes the dialog box without creating a new calibration document.

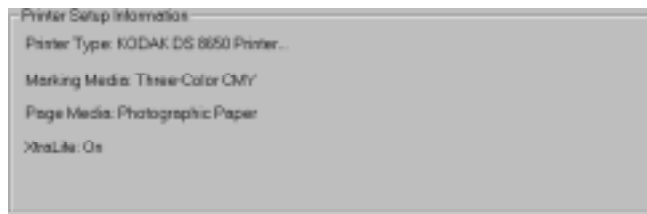
Calibration Document Window

The Calibration Document window allows you to specify information about the calibration table.



Printer Setup Information

The *Printer Setup Information* box lists information about the printer type, ribbon, and paper type for which the printer will be calibrated.



Printer Description

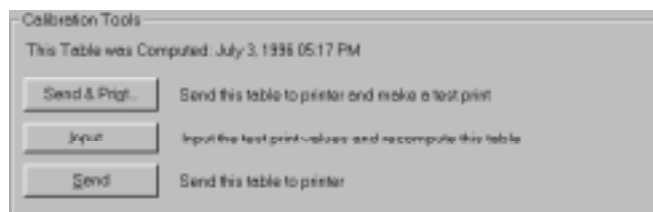
The *Printer Description* text box allows you to enter information that describes the printer for which the calibration table will be used. The text you enter is used to help describe the specifics of a particular calibration table. This text is not printed on the test print. An entry is optional. Use the Edit menu when you enter text.

Media Description

The *Media Description* text box allows you to enter information that describes the media for which the calibration table will be used. The text you enter is used to help describe the specifics of a particular calibration table. This text is not printed on the test print. An entry is optional. Use the Edit menu when you enter text.

Calibration Tools

Calibration Tools offers handling options for the calibration table.



Send & Print—sends the current calibration table to the printer. A calibration print is generated so you can evaluate the results.

Input—accesses the Input Test Print Values dialog boxes so you can enter *Visual Gray Balance*, *Visual Linearity*, and *Densitometer* data.

Send—sends the current calibration table to the printer without generating a calibration print. This button is usually used after you have created a test print and have recomputed the calibration table.

2 Calibration Utility for MACINTOSH

This chapter describes how to install and use the Calibration Utility on a Macintosh system. You should be familiar with the Macintosh environment.

Installation

See the "Read Me" for instructions for installing the calibration utility.

System Requirements

Recommended System Configuration

- 68040 or PowerPC processor
- APPLE System 7.5
- 16 MB of RAM
- color monitor
- CD-ROM drive

Minimum System Configuration

- 68030 processor
- APPLE System 7.1
- 8 MB of RAM
- standard color or black and white monitor
(minimum resolution 640 x 400 pixels)

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Operating the Calibration Utility

The following steps describe how to start the Calibration Utility.

1. Double-click on the *Kodak DS Calibration Utility* icon on your hard drive.



Kodak DS Calibration Utility

A splash screen appears, then the Calibration Utility selection box appears.



2. Do one of the following:

- Click on the *Begin Easy Cal* button to start up Easy Cal.

Information about the Easy Cal calibration procedure is in “Using Easy Cal to Calibrate Your Printer” on page 2–4.

or

- Click on the *Launch Normal Utility* button to start up Normal Utility.

Information about the Normal Utility calibration procedure is in “Using Normal Utility to Calibrate Your Printer” on page 2–14.

NOTE: If you want to go directly to Normal Utility without the Calibration Utility selection dialog appearing each time you start the Calibration Utility, select the check box labeled *At start-up, launch normal utility and don't show this screen*. The corresponding check box (*Show Easy Cal selection screen at start-up*) in the Preferences dialog box (accessed from the File menu) is deselected.

To use Easy Cal from within Normal Utility, pull down the Easy-Cal menu and select *Begin...* or *Begin with Previous Settings...*

If you want the Calibration Utility selection box to appear when you start up the Calibration Utility, select the *Show Easy Cal selection screen at start-up* check box in the Preferences dialog box.

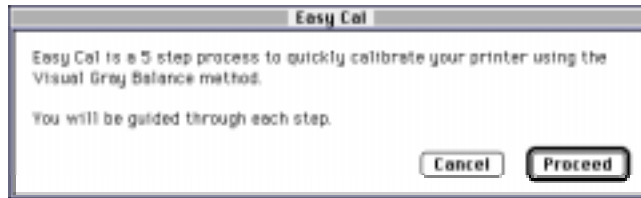
For more information about the options in the Preferences dialog box, refer to “Option Descriptions” on page 2–41.

Using Easy Cal to Calibrate Your Printer

The Easy Cal calibration procedure provides you with steps that guide you through the process of calibrating your printer using a Visual Gray Balance calibration.

NOTE: The Easy Cal calibration procedure cannot be used to calibrate a printer that is using black-only ribbon.

When you click on the *Begin Easy Cal* button in the Calibration Utility selection dialog, the Easy Cal calibration procedure starts up and the following dialog box appears.



- Click on the *Proceed* button.

The Easy Cal Step 1 of 5 dialog box appears.



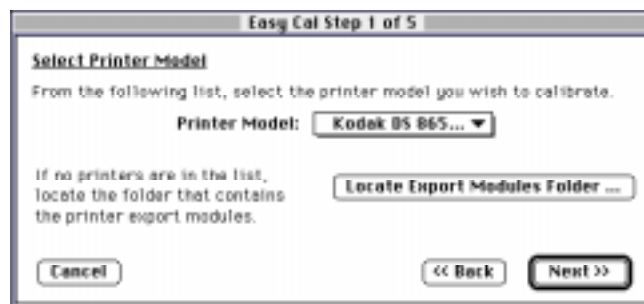
NOTE: Clicking on the *Cancel* button accesses Normal Utility.

Easy Cal Step 1

The Easy Cal Step 1 dialog box allows you to select a printer model to calibrate and find the corresponding export module.

If you do not need to specify a different printer, click on the *Next>>* button in the Easy Cal Step 1 dialog box and go to “Easy Cal Step 2.”

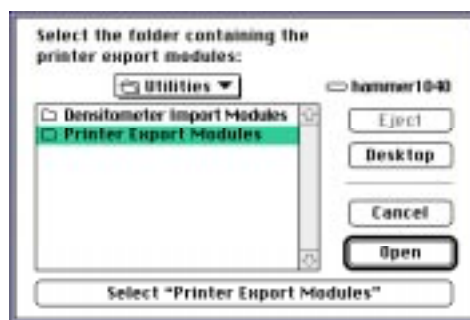
1. Select a printer on the *Printer Model* menu.



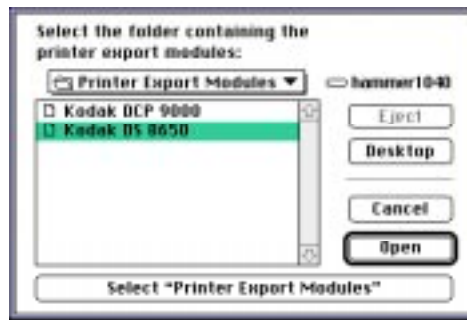
NOTE: If there are no printers on the *Printer Model* menu or the printer you want to calibrate does not appear on the menu, you must find and select the export module for the printer that you want to calibrate.

2. Click on the *Locate Export Modules Folder...* button.

A selection box appears. The selection box shows the folder in which the Calibration Utility was installed. The name of the export module appears in the *Files* list.

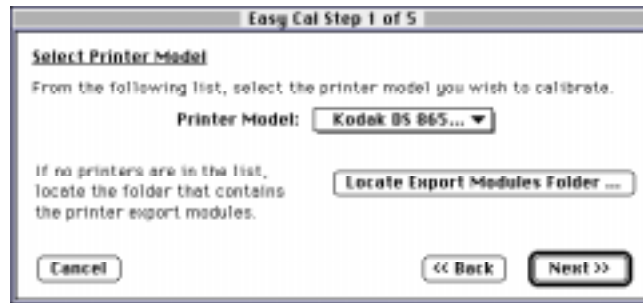


3. Find and open the folder that contains the export module.



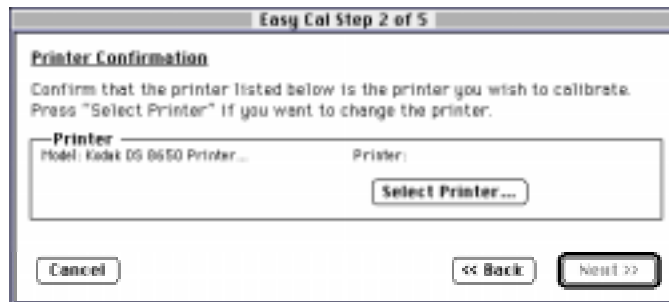
4. Select the export module you want to use.
5. Click on *Open* button.

You return to the Easy Cal Step 1 dialog box. The Calibration Utility now can find and use the export module so it can transfer data to the printer.



6. Click on the *Next >>* button.

The Easy Cal Step 2 dialog box appears.

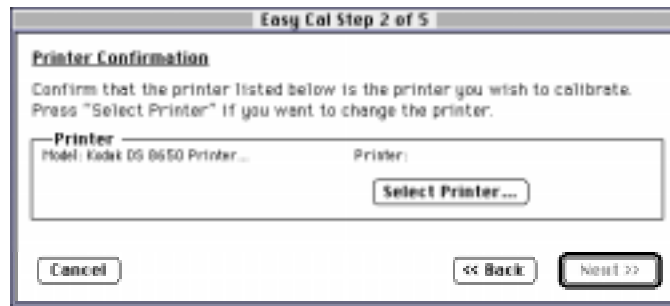


Easy Cal Step 2

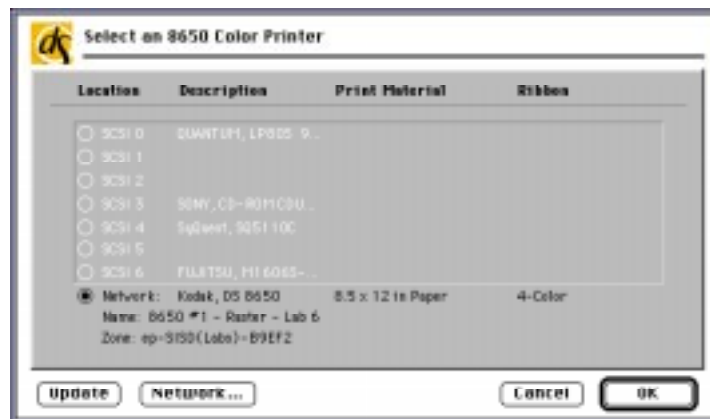
The Easy Cal Step 2 dialog box allows you to specify a different printer to calibrate than the one that appears in the *Printer* box.

NOTE: If you do not need to specify a different printer, you can ignore the following steps and click on the *Next>>* button in the Easy Cal Step 2 dialog box and go to “Easy Cal Step 3.”

1. Click on the *Select Printer...* button.



The Select Printer dialog box appears.

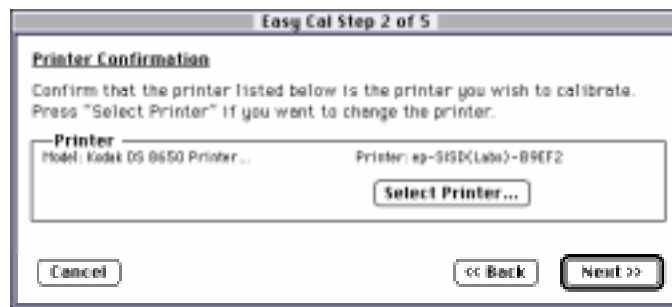


NOTE: Your Select Printer dialog box may appear different, depending on your printer export module.

If this is the first time that the Calibration Utility has been run or if the Preferences files have been deleted, you may be prompted to locate the necessary files for the export module.

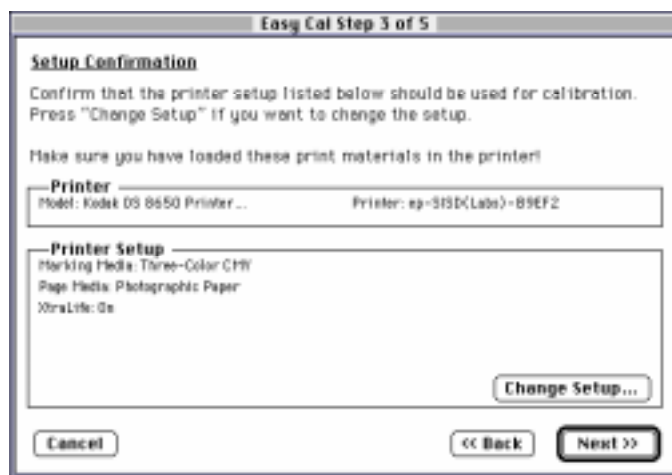
2. Click on the button for the port to which the printer is connected.
3. Click on the *OK* button.

You return to the Easy Cal Step 2 dialog box.



4. Click on the *Next >>* button.

The Easy Cal Step 3 dialog box appears.

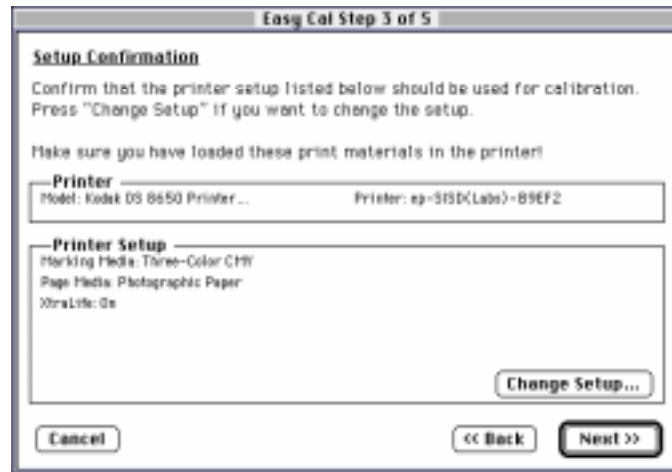


Easy Cal Step 3

The Easy Cal Step 3 dialog box allows you to specify a different printer media to calibrate than the one that appears in the *Printer Setup* box.

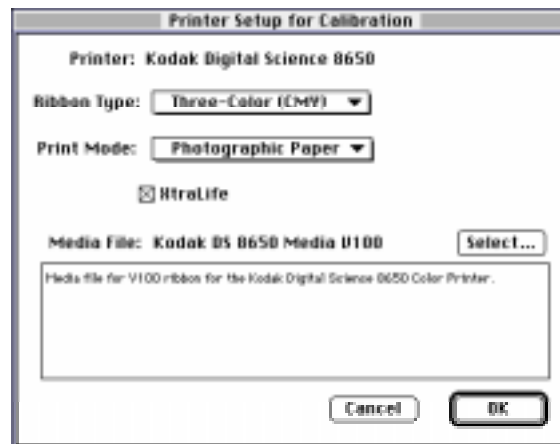
1. Make sure that the paper and media types for which you want to calibrate are loaded in the printer.

NOTE: If you do not need to specify a different printer media, you can ignore the following steps and click on the *Next>>* button in the Easy Cal Step 3 dialog box and go to “Easy Cal Step 4.”



2. Click on the *Change Setup...* button.

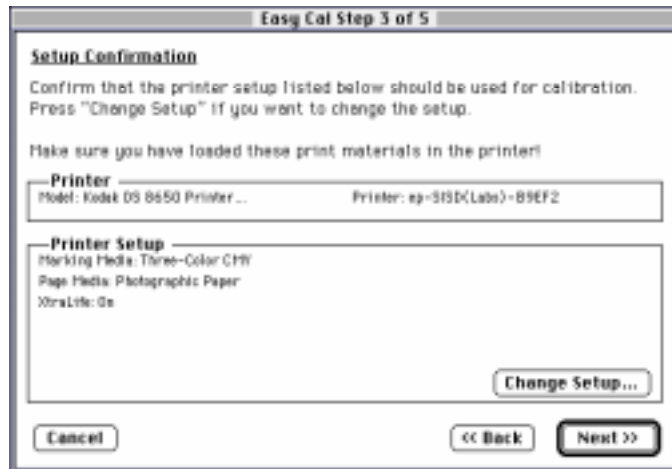
The Printer Setup for Calibration dialog box appears.



NOTE: Your Printer Setup for Calibration dialog box may appear different, depending on your printer export module.

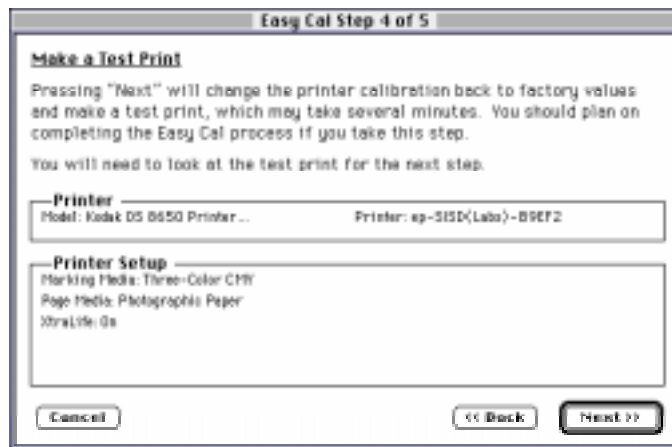
3. Make any necessary changes in the Printer Setup for Calibration dialog box.
4. Click on the *OK* button.

You return to the Easy Cal Step 3 dialog box.



5. Click on the *Next >>* button.

The Easy Cal Step 4 dialog box appears.



Easy Cal Step 4

The Easy Cal Step 4 dialog box contains printer and printer setup information that will be used in the test print that is created in this step.

NOTE: If the Easy Cal Step 4 dialog box does not contain printer and printer setup information, click on the <<Back button and click on the *Change Setup...* button.

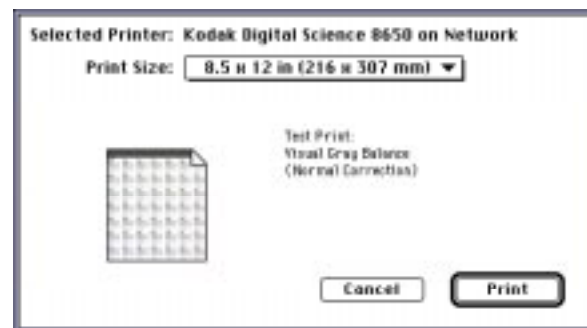
1. Make sure that the *Printer* and *Printer Setup* information is correct.



NOTE: Clicking on the *Next>>* button sends the default table to the printer. The previous table is overwritten.

2. Click on the *Next >>* button.

The default table is sent to the printer and the previous table is overwritten. The Send and Print dialog box appears.



NOTE: Your Send and Print dialog box may appear different, depending on your printer export module.

3. Click on the *Print* button.

Your computer begins processing information. This may take a few minutes. The calibration test print is printed on the specified printer. The Easy Cal Step 5 dialog box appears.



Easy Cal Step 5

Use the test print to calibrate your printer in the Easy Cal Step 5 dialog box.

1. Look at the test print and decide which grayscale cluster appears the most neutral gray.
- NOTE: If you want to print another test print, click on the <<Back button to return to the Easy Cal Step 4 dialog box.
2. Type the number of the most neutral grayscale cluster in the *Cluster Number* text box.

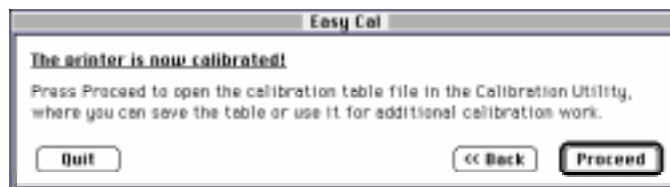


NOTE: If you want to print an updated test print, you can click on the <<Back button to return to the Easy Cal Step 4 dialog box.

If cluster number 225 on the updated test print is the most neutral gray, then the calibration is successful. Type **225** in the *Cluster Number* text box and go to step 3.

3. Click on the *Done* button.

The printer calibration begins. When the calibration is complete, the following dialog box appears.



4. Do one of the following:

- If you do not want to make another test print and you do not want to save the calibration table, click on the *Quit* button to quit the Calibration Utility.

or

- If you want to save the calibration table, click on the *Proceed* button to access a document window. Refer to “Using the Calibration Document Window” on page 2–24.

Saving Your Calibration Table

You may want to save the calibration table you just created to use as a starting point for later calibrations.

- Pull down the File menu and select *Save* to save changes to the current calibration table.
- Pull down the File menu and select *Save As* to access a selection box in which you can specify a new name and location for the current calibration table.

Using Normal Utility to Calibrate Your Printer

The Normal Utility calibration procedure allows you to create a new calibration document or start from a calibration document that was previously created and saved.

When you click on the *Launch Normal Utility* button in the Calibration Utility selection box, the Normal Utility calibration procedure starts up and the Printer Calibration Utility window opens.

NOTE: If this is the first time that the Calibration Utility has been run, or if there are no printers on the *Select Printer* menu, or if the Preferences files have been deleted, you must select and open the export module for the printer that you want to calibrate.

You can either create a new calibration table or open an existing one to calibrate your printer.

- Information about creating a new calibration table is in “Creating a New Calibration Document” on page 2–17.
- Information about using an existing calibration table is in “Opening an Existing Calibration Table” on page 2–23.

Setting Preferences

You can specify the folders that contains the export module and the import module (used for densitometer settings) in the Preferences dialog box.

1. Pull down the File menu and select *Preferences*.



The Preferences dialog box appears.



2. Click on the *Select* button next to "Printer Export Modules Folder."

A file selection dialog box appears.

3. Find and open the folder in which the export module is located.
4. Click on the *OK* button.

You return to the Preferences dialog box.

5. Click on the *Select* button next to "Densitometer Import Modules Folder."

A file selection dialog box appears.

6. Find and open the folder in which the import module is located.
7. Click on the *OK* button.

You return to the Preferences dialog box.

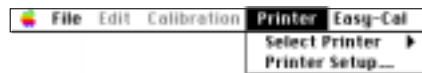
8. Click on the *OK* button.

Your selections are saved.

Selecting and Setting Up a Printer

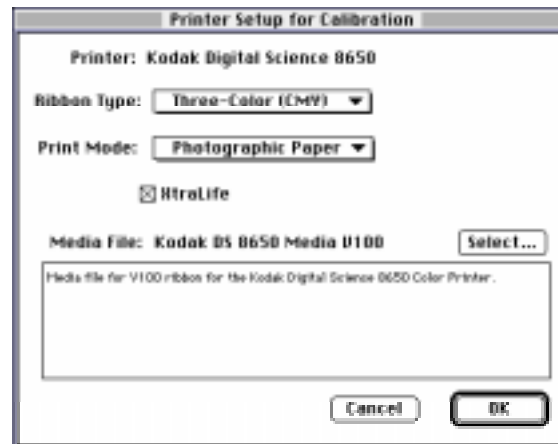
Select a printer and specify the printer media before you start a calibration.

1. Pull down the Printer menu.



2. Choose *Select Printer* and highlight the printer you want to calibrate.
3. Pull down the Printer menu and choose *Printer Setup*.

The Printer Setup for Calibration dialog box appears.



NOTE: The Printer Setup for Calibration dialog box may appear different, depending on the selected printer.

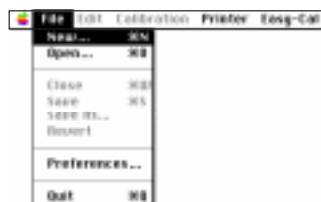
4. Select the media combination(s) for which you are calibrating.
5. Click on the *OK* button.

The Printer Setup for Calibration dialog box closes.

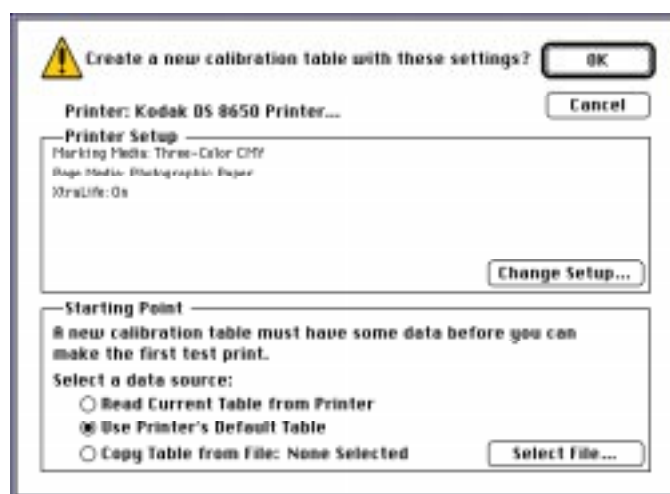
Creating a New Calibration Document

You can either create a new calibration document or open an existing one to calibrate your printer.

1. Pull down the File menu and select *New*.



The Calibration Table dialog box appears.



Ribbon and paper type information may not appear in the *Printer Setup* box if you have not first used the Printer menu's *Printer Setup...* option.

If the correct paper and media types do not appear, refer to the previous section, "Selecting and Setting Up a Printer." If the correct paper and media types appear, refer to "Selecting a Starting Point for the Calibration Document" on page 2-18.

NOTE: The *Read Current Table From Printer* radio button will not be available if the printer cannot return this information (for example, many printers connected via parallel will have this option deselected).

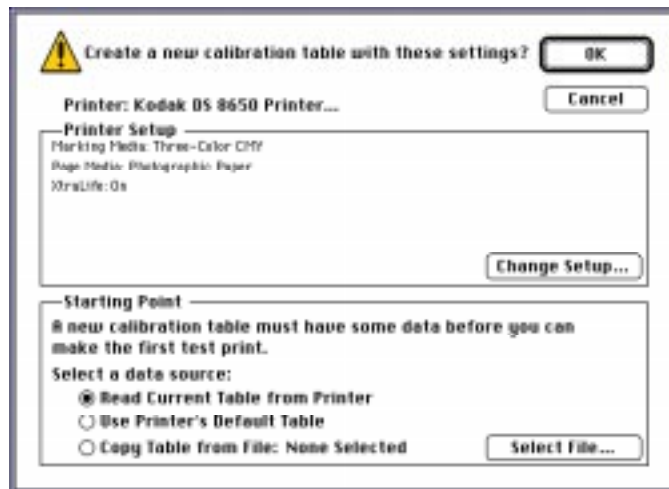
Selecting a Starting Point for the Calibration Document

This section describes how to select a starting point (base file) for the calibration document. There are three ways to access a base file:

- *Read Current Table from Printer*—uses the printer's current table (refer to "Using the Printer's Current Calibration Table as the Starting Point" on this page).
- *Use Printer's Default Table*—uses the printer's default table (refer to "Using the Printer's Default Calibration Table as the Starting Point" on page 2–20).
- *Copy Table from File*—uses a previously created and saved calibration table (refer to "Using an Existing Calibration Table as the Starting Point" on page 2–21).

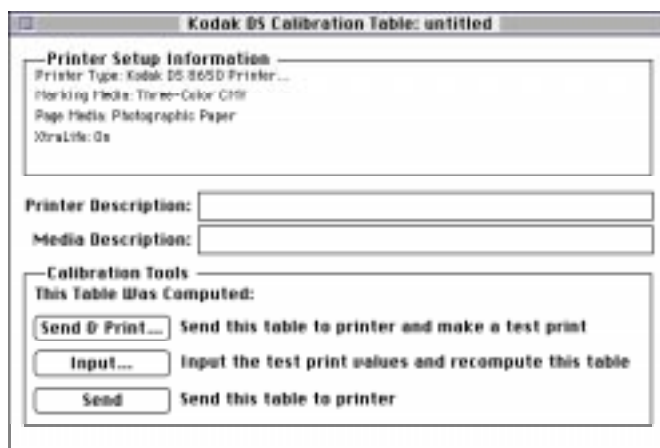
Using the Printer's Current Calibration Table as the Starting Point

1. Select the *Read Current Table from Printer* radio button in the *Starting Point* box.



2. Click on the *OK* button.

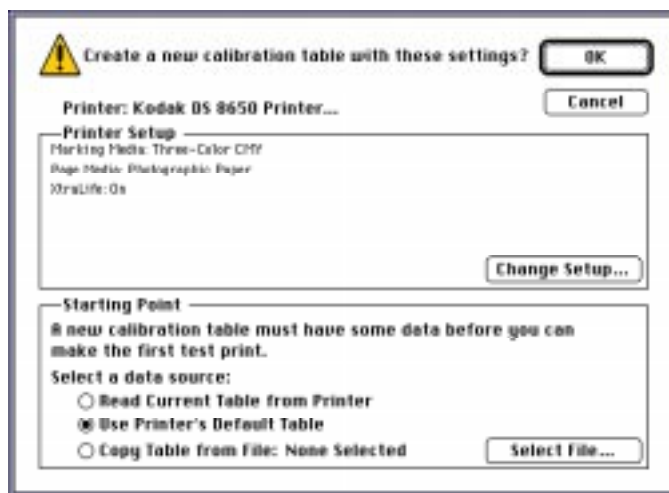
A Calibration Document window appears.



3. Go to "Using the Calibration Document Window" on page 2-24.

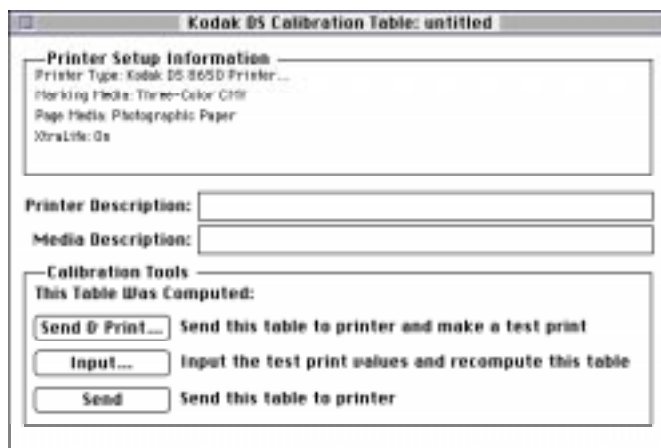
Using the Printer's Default Calibration Table as the Starting Point

1. Select the *Use Printer's Default Table* radio button in the *Starting Point* box.



2. Click on the *OK* button.

A Calibration Document window appears.



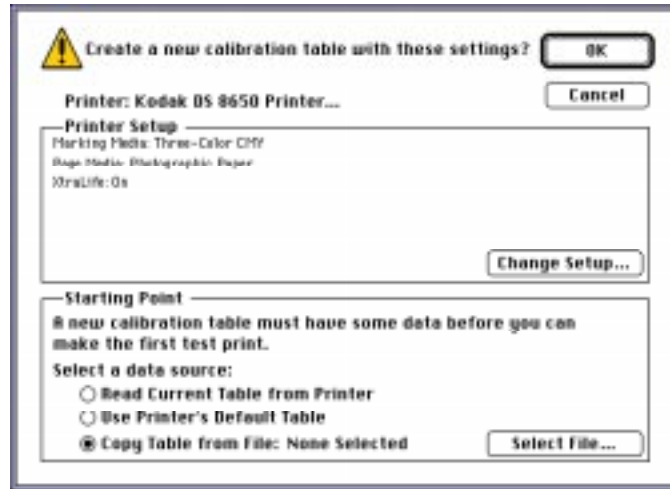
3. Go to "Using the Calibration Document Window" on page 2-24.

Using an Existing Calibration Table as the Starting Point

You can follow the steps below only if you have previously created and saved a calibration table. If you are using the Calibration Utility for the first time, no calibration tables exist yet for use as a starting point.

The table you select to use as a starting point does not contain printer setup information. Follow the instructions in “Selecting and Setting Up a Printer” on page 2–16 to specify information about the printer paper and media.

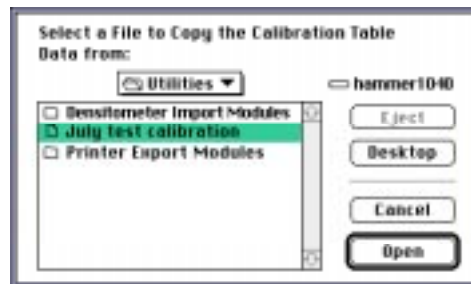
1. Select the *Copy Table from File*: radio button in the *Starting Point* box.



2. Click on the *Select File...* button.

A file selection dialog box appears.

3. Find and open the folder that contains the calibration table you want to use as the starting point for your new table.
4. Select the calibration table you want to copy.

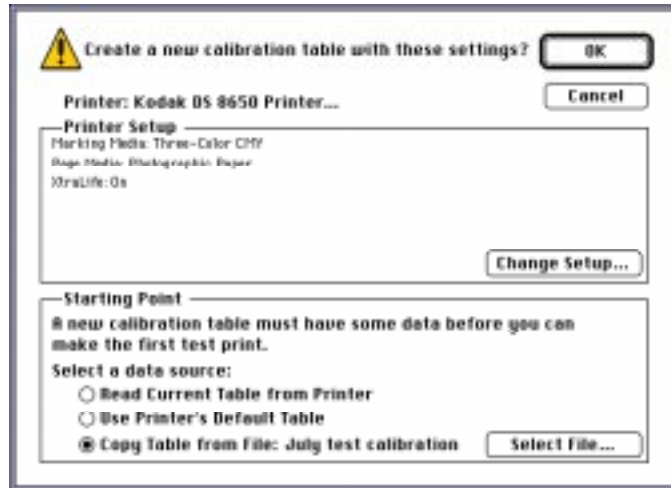


NOTE: The data in the table selected as a starting point is specific to the paper and media types specified when the table was created. You cannot select documents for the incorrect paper and ribbon type.

The files you can select are files created by the Calibration Utility or any file that has a .kcu extension. However, you can only choose tables that are configured for that particular printer and media.

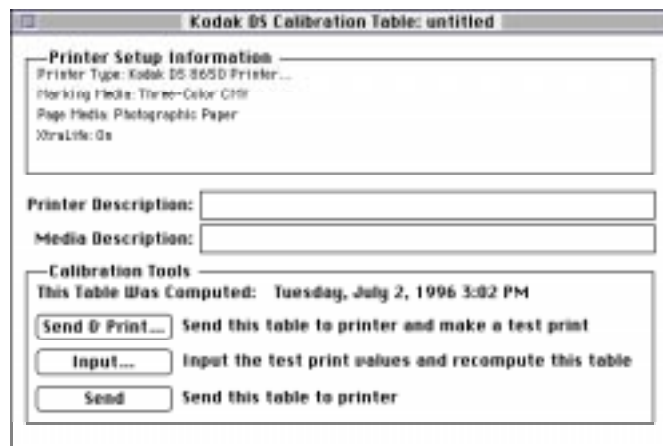
5. Click on the *Open* button.

The file selection dialog box closes. The name of the selected calibration table appears after the *Copy Table from File:* radio button.



6. Click on the *OK* button.

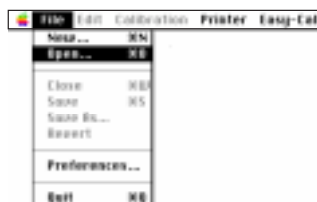
A Calibration Document window appears.



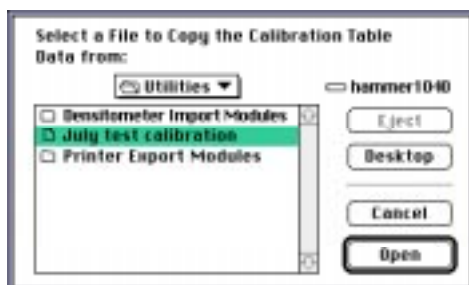
7. Go to "Using the Calibration Document Window" on page 2–24.

Opening an Existing Calibration Table

1. Pull down the File menu and select *Open*.

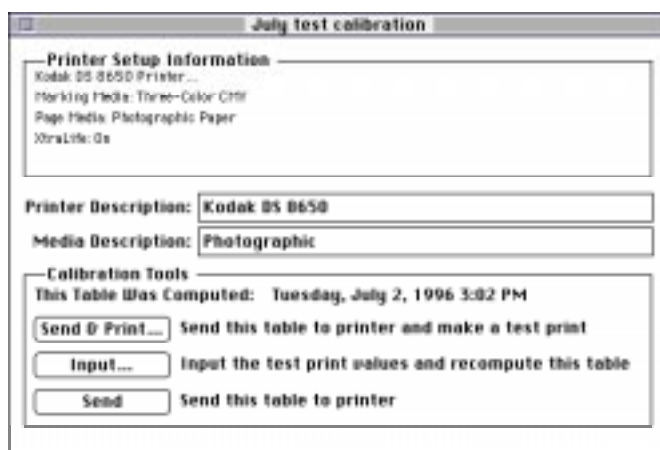


A file selection dialog box appears.



2. Find and open the folder that contains the calibration table you want to use.
3. Select the calibration table you want to use.
4. Click on the *Open* button.

A Calibration Document window appears.

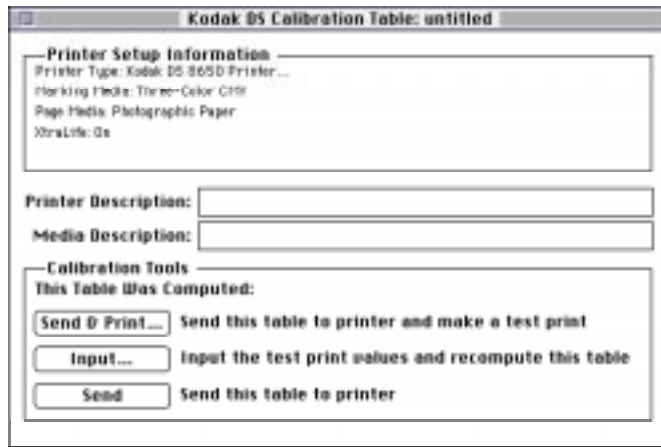


5. Go to "Using the Calibration Document Window" on page 2–24.

Using the Calibration Document Window

Use the Calibration Document window to set up and run Visual Gray Balance, Visual Linearity, and Densitometer calibrations.

1. Make sure that the information in the *Printer Setup Information* box is correct and make sure that you are creating a calibration table for the media you want to use.



2. Type information about the printer you are calibrating in the *Printer Description* text box.
3. Type information about the media combination for which you are calibrating in the *Media Description* text box.

NOTE: Entries in the *Printer Description* and *Media Description* text boxes are optional and do not appear on the test print.

You can calibrate your printer. Refer to "Calibrating the Printer" on page 2–25.

NOTE: If you are using black-only media, you cannot use the Visual Gray Balance calibration method to calibrate your printer. You must go directly to the Visual Linearity calibration procedure.

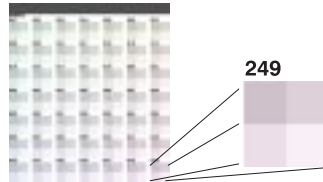
Calibrating the Printer

You can now calibrate your printer by running the Visual Gray Balance and Visual Linearity calibration procedures.

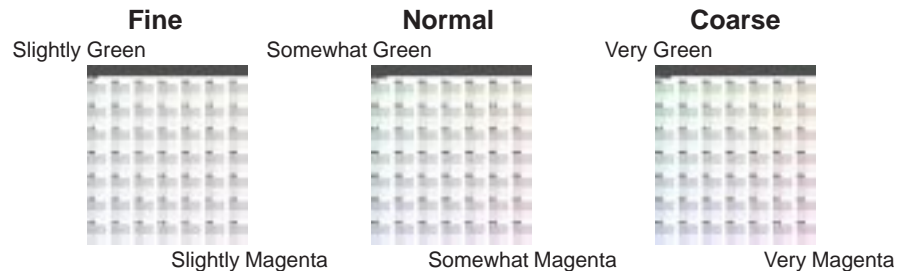
If you have a densitometer, you can run just the Densitometer calibration procedure. You do not have to do Visual Gray Balance and Visual Linearity calibrations. Refer to “Running a Densitometer Calibration” on page 2–36.

Visual Gray Balance

Visual Gray Balance calibrates your printer so it produces a neutral gray. The Calibration Utility allows you to select from three Visual Gray Balance calibration prints. Each of these prints presents 49 numbered grayscale clusters. Each cluster is made up of four boxes of varying densities. A Visual Gray Balance calibration print looks similar to the following example.



The clusters on the three prints include a range of colors. Clusters in the upper left corner will have a green hue. Clusters in the lower right corner will have a magenta hue. Three different calibration prints allow you to choose the degree of color shift.



Fine—offers the least degree of difference between clusters. This print is useful when it is difficult to choose between clusters on the Normal calibration print.

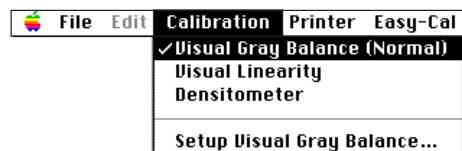
For example, you printed a Normal print and you find that the most neutral-looking clusters are next to each other, but one still looks slightly green while the other still looks slightly magenta. You can print a Fine calibration print to get more choices within a smaller range of colors.

Normal—offers a moderate degree of difference between clusters. The amount of correction in this print will be appropriate for most calibration jobs.

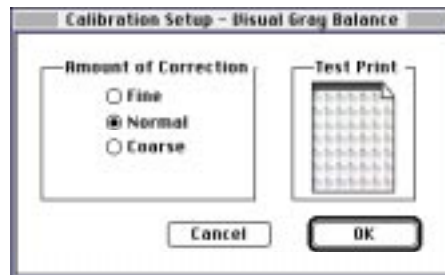
Coarse—offers the greatest degree of difference in clusters. This print is useful when neutral areas in your prints appear very green or very magenta.

Running a Visual Gray Balance Calibration

1. Pull down the Calibration menu and select *Visual Gray Balance*.
2. Pull down the Calibration menu and select *Setup Visual Gray Balance...*



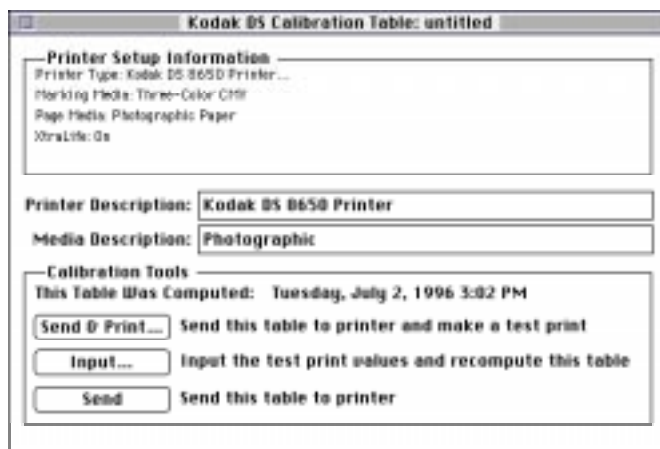
The Calibration Setup – Visual Gray Balance dialog box opens.



3. Select a radio button in the *Amount of Correction* box.

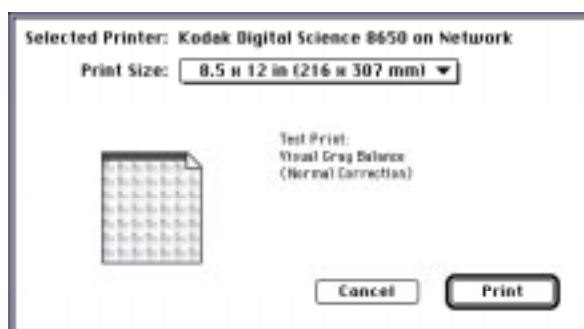
- Click on the *OK* button.

You return to the Calibration Document window.



- Click on the *Send & Print* button.

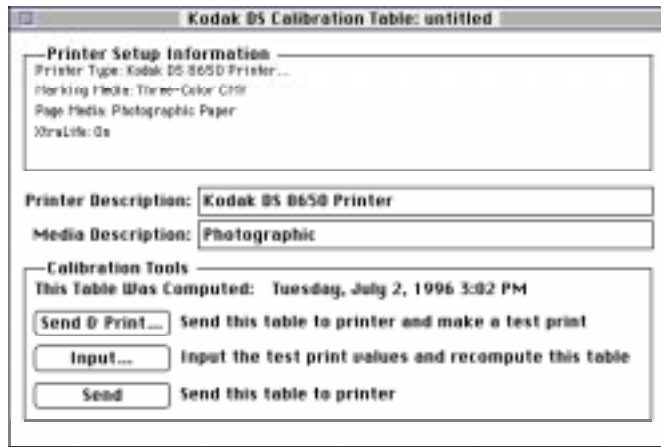
The Send and Print dialog box appears.



NOTE: Your Send and Print dialog box may appear different, depending on your printer export module.

6. Click on the *Print* button.

You return to the Calibration Document window. The calibration test print is printed on the specified printer.



7. View the calibration test print and determine which cluster appears the most neutral.

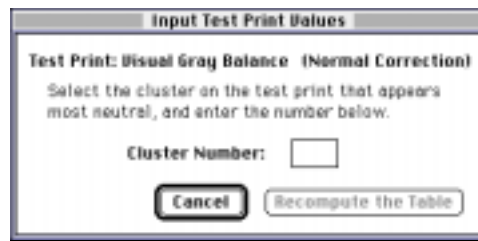
If the Visual Gray Balance most-neutral cluster number on the test print ends in 25, the printer is already calibrated. You should now perform a Visual Linearity calibration.

If the Visual Gray Balance number on the test print does not end in 25, you must recalibrate the printer to the most neutral cluster number.

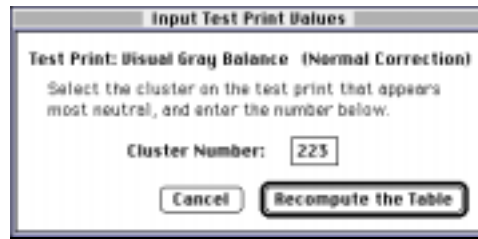
NOTE: If you enter a value that ends in 25, the calibration table does not change.

8. Click on the *Input* button.

The Input Test Print Values dialog box appears.

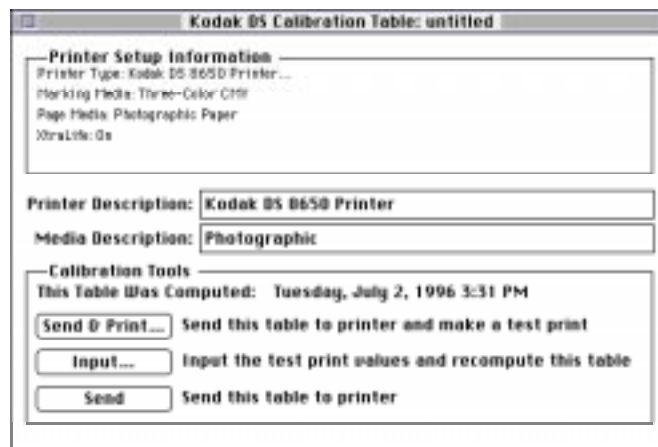


9. Type the number of the most-neutral cluster in the *Cluster Number* box.



10. Click on the *Recompute the Table* button.

The calibration table data is updated and the Calibration Document window appears.



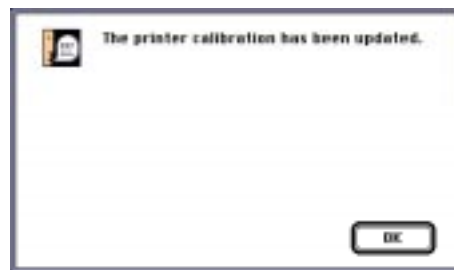
11. Click on the *Send* button if you are satisfied with the neutral in the cluster you selected and you do not want to look at another calibration print.

A confirmation box appears.



12. Click on the *Send* button.

The recomputed table is sent to the printer and the following message appears.



13. Click on the *OK* button.

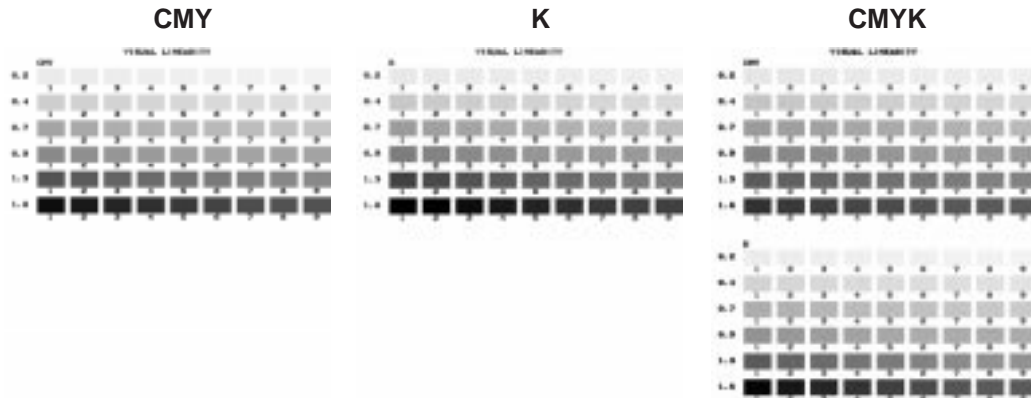
The calibration table is computed using the specified values and you return to the Calibration Document window. You should now perform a Visual Linearity calibration.

NOTE: You should make another test print to verify your input value adjustments.

Visual Linearity

Visual Linearity calibrates your printer so it produces the correct shading (lightness/darkness).

Use the Linearity Reference Card to select a cluster for each of the six density ranges. Visual Linearity calibration prints look similar to the following examples.



Using the Linearity Reference Card

The Linearity Reference Card is included with the Calibration Utility. Use this Reference Card for performing Visual Linearity calibrations. Following are instructions for using the Reference Card.

1. Lay the Linearity Reference Card with the name at the top on the first row of the calibration print.

NOTE: It may not be possible to find a cluster in which all six gray levels exactly match the Linearity Reference Card. Select the cluster that appears to be the closest match.

2. Slide the Linearity Reference Card across each patch in the row and determine which of the nine patches in the row most closely matches the darkness on the Reference Card.

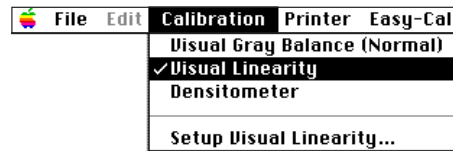
NOTE: Match the darkness on the Reference Card, not the color.

3. Repeat step 2 for each row on the calibration print.

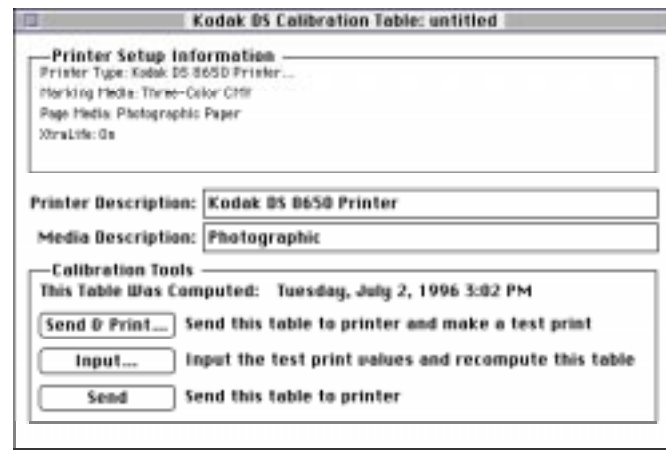
Running a Visual Linearity Calibration

After you have run a calibration using the *Visual Gray Balance* option, use the *Visual Linearity* option to recompute the current calibration table using values from the test print.

1. Pull down the Calibration menu and select *Visual Linearity*.

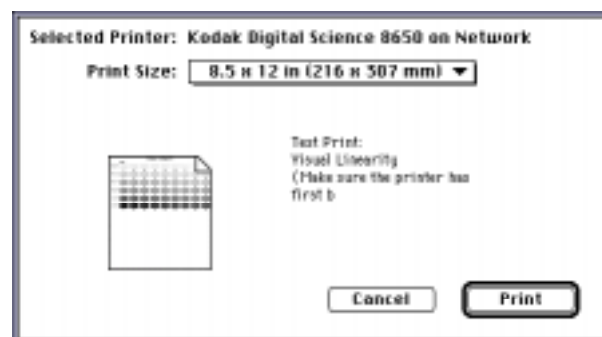


You return to the Calibration Document window.



2. Click on the *Send & Print* button.

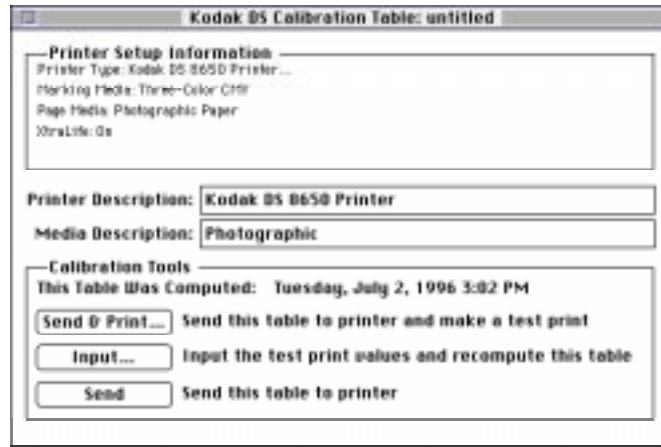
The Send and Print dialog box opens.



NOTE: Your Send and Print dialog box may appear different, depending on your printer export module.

3. Click on the *Print* button.

You return to the Calibration Document window. The calibration test print is printed on the specified printer.



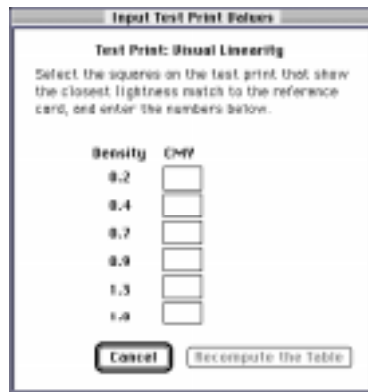
4. Use the Linearity Reference Card to select a box number for each of the six density ranges.

If all of the Visual Linearity numbers on the test print are box number 5, the printer is already calibrated. You can close the Calibration Utility.

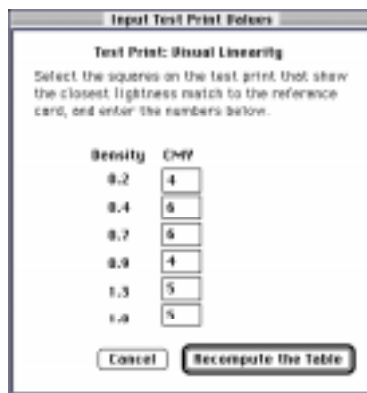
If the Visual Linearity numbers on the test print are not all box number 5, you must recalibrate the printer. Go to step 5.

5. Click on the *Input* button.

The Input Test Print Values dialog box opens.



6. Type in the values you select from the test print in the text boxes.



The dialog box is titled "Input Test Print Values". It contains a section titled "Test Print: Visual Linearity" with the instruction: "Select the squares on the test print that show the closest lightness match to the reference card, and enter the numbers below." Below this is a table with two columns: "Density" and "CMY". The "Density" column lists values 0.2, 0.4, 0.7, 0.9, 1.3, and 1.9. The "CMY" column contains six text input boxes, each with a number (4, 5, 5, 4, 5, 5) entered. At the bottom are two buttons: "Cancel" and "Recompute the Table".

Density	CMY
0.2	4
0.4	5
0.7	5
0.9	4
1.3	5
1.9	5

Buttons: Cancel, Recompute the Table

7. Click on the *Recompute the Table* button.

The calibration table is computed using the specified values and the Calibration Document window appears.

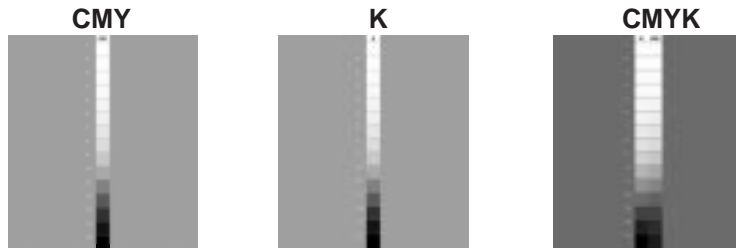
8. Click on the *Send* button to send the table to the printer.

Densitometer

A Densitometer calibration corrects the printer's response based on the densitometer reading for selected patches. If you have a densitometer, you do not need to run Visual Gray Balance and Visual Linearity calibrations. You only have to run the Densitometer calibration.

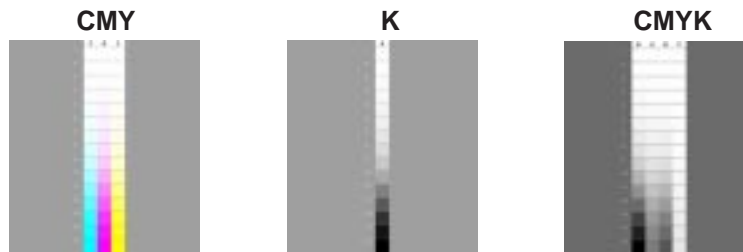
Print a test print and read it with a densitometer. There are two kinds of densitometer prints: process and separation. The kind of print you get depends on your printer. Densitometer calibration prints look similar to the following examples.

Process Densitometer Prints



example: from a Kodak XLS 8600 Printer or *Kodak Digital Science™* 8650 Printer

Separations Densitometer Prints



example: from a *Kodak Digital Science™* DCP 9000 Printer

NOTE: Separation prints have separate individual colors for each of the cyan, magenta, and yellow planes. Process prints combine the cyan, magenta, and yellow into a single gray column. Black is always a separate column.

Using a densitometer, you enter the density results for each of the patches in the Densitometer Input Test Print Values dialog box. In each case, you always input the visual component for the patch.

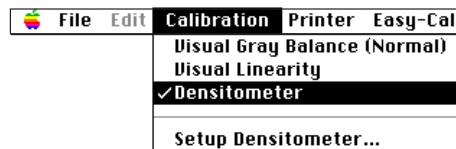
For separations prints, enter the “C” component for the cyan patches, the “M” component for the magenta patches, and the “Y” component for the yellow patches.

For process prints, enter the “C,” “M,” and “Y” components for each of the CMY patches.

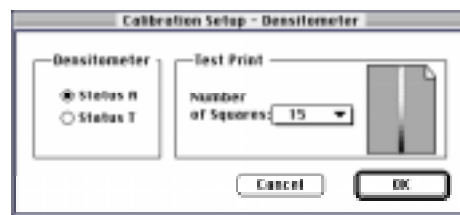
Running a Densitometer Calibration

If you have a densitometer, you can run the Densitometer calibration instead of the Visual Gray Balance and Visual Linearity calibrations.

1. Set up your densitometer.
2. Pull down the Calibration menu and select *Densitometer*.

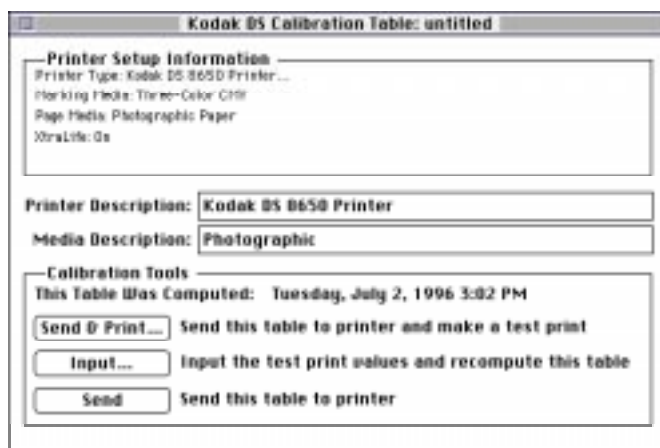


3. Pull down the Calibration menu and select *Setup Densitometer....*
The Calibration Setup – Densitometer dialog box appears.



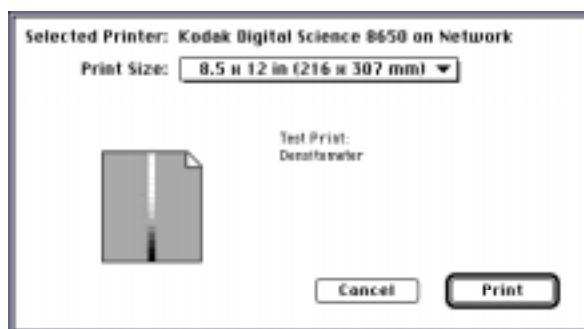
4. Select a densitometer status in the *Densitometer* box.
5. Pull down the *Number of Squares* menu in the *Test Print* box and select the number of squares in your test print.
6. Click on the *OK* button.

You return to the Calibration Document window.



7. Click on the *Send & Print* button.

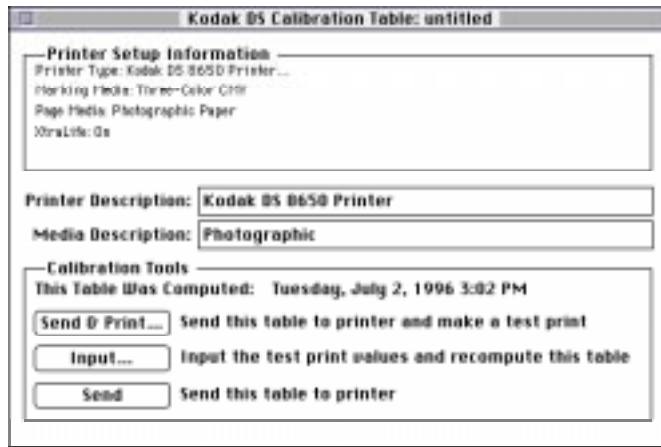
The Send and Print dialog box appears.



NOTE: Your Send and Print dialog box may appear different, depending on your export module.

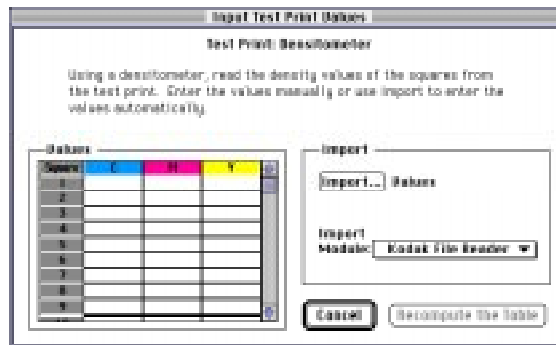
8. Click on the *Print* button.

You return to the Calibration Document window. The calibration test print is printed on the specified printer.



9. Click on the *Input* button.

The Input Test Print Values dialog box appears.

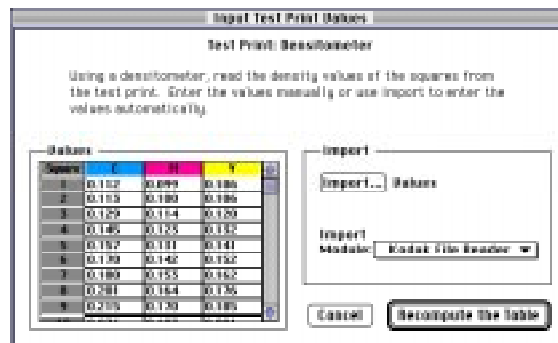


One, three, or four Density Value columns appear in the Input Test Print Values dialog box, depending on the calibration your printer requires (for black ribbon, three-color ribbon, or four-color ribbon).

The number of Density Value rows is determined by the selection in the *Number of Squares* menu (15 or 38).

Valid characters in this dialog box include numbers from 0 to 9, periods (.), and commas (,). The valid range is 0 to 3.999 (0 to 3,999). Move from cell to cell using your keyboard's arrow keys. You can copy and paste any group of contiguous fields in a rectangular pattern.

10. Type the test print values in the text boxes.



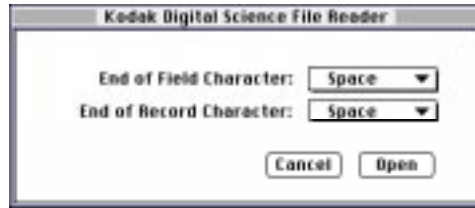
NOTE: You can import densitometer data automatically with an import module. If your densitometer has an associated import module, the densitometer readings will be imported directly into the dialog box. Using the Kodak File Reader, you can read in a file of data and specify the end of Field and End of Record characters. For more information, refer to "Import" on page 2-40.

11. Click on the *Recompute the Table* button.

The calibration table is computed using the specified values and the Calibration Document window appears.

Import

The selected import module opens a dialog box when you click on the *Import* button in the Densitometer — Input Test Print Values dialog box. For the Kodak File Reader, the following dialog box appears when you click on the *Import* button.



End of Field Character—specify the end-of-field character used in your densitometer file: “space,” “comma,” “tab,” “CR” (carriage return), “CR-LF” (carriage return/line feed), “LF” (line feed), and “Semi-colon.”

End of Record Character—specify the end-of-record character used in your densitometer file: “space,” “comma,” “tab,” “CR” (carriage return), “CR-LF” (carriage return/line feed), “LF” (line feed), and “Semi-colon.”

Open—the *Open* button allows you to find and import the densitometer file with the values you want to use in the Input Test Print Values dialog box.

Option Descriptions

This section describes the Calibration Utility menu and dialog box options.

File Menu

This section describes the options on the File pulldown menu.



New—accesses the Calibration Document window so you can select options for the current printer setup.

Open—accesses a file selection dialog box so you can select an existing calibration table from which to start.

Close—closes the current calibration document.

Save—saves changes to the current calibration document. When you name a calibration document, you may want to include characters that indicate the selected media types. Saving a document this way allows you to select it later to use as a starting point for a new calibration document.

Save As...—accesses a dialog box in which you can specify a new name and location for the current calibration settings. When you name a calibration document, you may want to include characters that indicate the selected media types. Naming a document this way allows you to select it later to use as a starting point for a calibration document.

Revert—returns a calibration document to its original state. All recomputations are discarded.

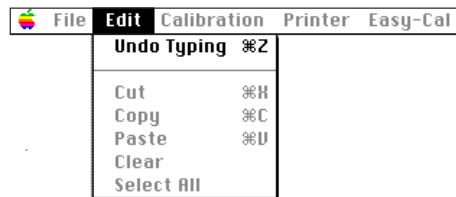
Preferences...—accesses a dialog box that allows you to specify the folder containing the export module and the folder containing the import module (used for densitometer settings).



Quit—exits the Calibration Utility.

Edit Menu

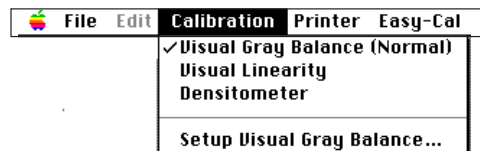
The Edit menu is enabled only when the Calibration Document window is open.



The options in the Edit menu are enabled only when you enter text in the *Printer Description* and *Media Description* boxes.

Calibration Menu

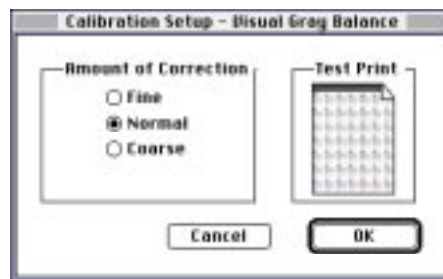
The Calibration menu is enabled when the Calibration Document window is open. You can choose to calibrate based on your input to the Visual Gray Balance, Visual Linearity, and Densitometer dialog boxes.



Calibration Setup — Visual Gray Balance

This dialog box allows you to specify the degree of correction to apply with the current calibration table.

NOTE: If you are using black-only media, you cannot use the Visual Gray Balance calibration method to calibrate your printer.



Amount of Correction

The *Amount of Correction* buttons allow you to specify the degree of difference between neutrals the calibration print will present.

Fine—the calibration print offers the least degree of difference in neutrals between the cluster in the upper left corner and the cluster in the lower right corner. The cluster in the upper left corner is only slightly green and the cluster in the lower right corner is only slightly magenta.

Select “Fine” to get the smallest hue range. This means that the hue differences between clusters is small so you can fine-tune by choosing between very similar neutrals.

Normal—the calibration print offers a moderate degree of difference in neutrals between the cluster in the upper left corner and the cluster in the lower right corner. The cluster in the upper left corner is somewhat green and the cluster in the lower right corner is somewhat magenta.

Select “Normal” to get a larger hue range than “Fine.” This means that the hue differences between clusters is slightly larger and adjacent clusters are less similar.

Coarse—the calibration print offers the greatest degree of difference in neutrals between the cluster in the upper left corner and the cluster in the lower right corner. The cluster in the upper left corner is distinctly green and the cluster in the lower right corner is distinctly magenta.

Select “Coarse” to get the largest hue range. This means that the hue differences between clusters is easily discernible and adjacent clusters are distinctly different.

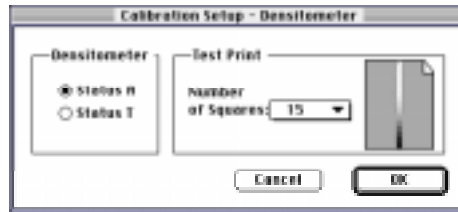
Calibration Setup — Visual Linearity

This setting allows you to specify values from a test print to recompute the current calibration table.

Calibration Setup — Densitometer

This dialog box allows you to use values from a densitometer text table to recompute the calibration table.

NOTE: Make sure that your densitometer is calibrated before you try to calibrate your printer with the densitometer values.



Densitometer

The *Densitometer* radio buttons allow you to specify what type of density data (*Status A* or *Status T*) your densitometer provides. The Calibration Utility calculates the table data using the density type that the export module needs for the current calibration slot.

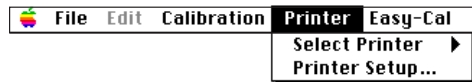
NOTE: Depending on the export module and settings, one of these options may not be available. For example, *Status A* is not available for the *Kodak Digital Science™* DCP 9000 Printer.

Test Print — Number of Squares

The *Number of Squares* menu in the *Test Print* box allows you to specify the number of squares (15 or 38) in your test print.

Printer Menu

The Printer menu allows you to select a printer or set up the printer from the menu bar.

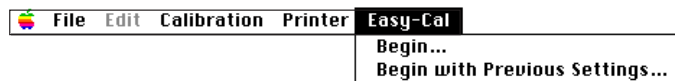


Select Printer—a menu with the printer selections for your system appears.

Printer Setup...—the Printer Setup for Calibration dialog box appears so you can make changes for the selected printer.

Easy-Cal Menu

The Easy-Cal menu allows you to start the Easy Cal calibration procedure from the menu bar.



Begin...—the Easy Cal calibration procedure starts up.

Begin with Previous Settings...—the Easy Cal Step 4 dialog box appears.

NOTE: The Easy Cal calibration procedure cannot be used to calibrate a printer that is using black-only ribbon.

Calibration Table Dialog Box

Pull down the File menu and select *New* to access a dialog box that allows you to create a new calibration table.



Printer Setup

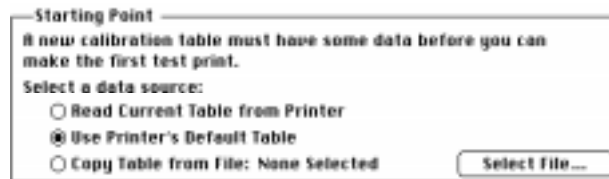
The *Printer Setup* box lists information about the ribbon and paper type for which the printer will be calibrated. Click on the *Change Setup* button to change the information that appears.



Change Setup—accesses the Printer Setup for Calibration dialog box so you can select options that match the media in the printer you are calibrating.

Starting Point

The *Starting Point* box allows you to select the data that will act as a base for the new calibration table.

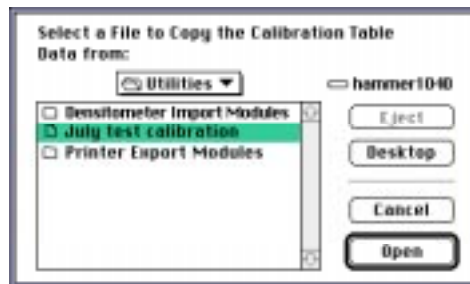


Read Current Table From Printer—allows you to retrieve and begin with the printer's current table. Once the table is loaded, you can edit it and recalibrate the printer. This option is not always available as a starting point.

Use Printer's Default Table—default printer data acts as the starting point for the new calibration document.

Copy Table from File—the calibration table you select with the *Select File* button acts as the starting point for the new calibration document.

Select File—opens a selection box so you can choose an existing calibration document from which to start.



OK

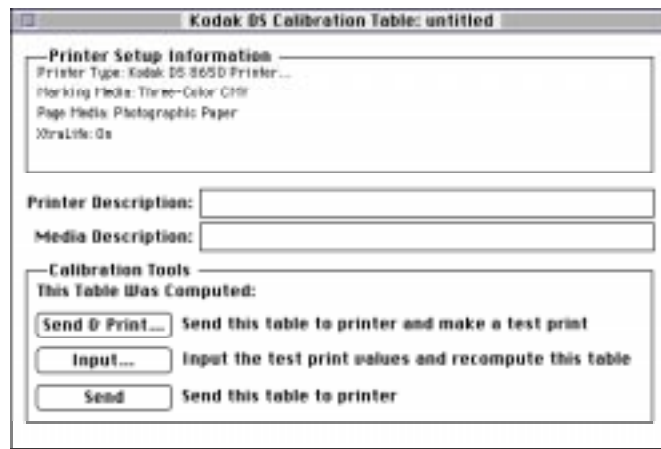
The *OK* button closes the dialog box and opens the Calibration Document window. Refer to “Calibration Document Window” on page 1–48 for more information.

Cancel

The *Cancel* button closes the dialog box without creating a new calibration document.

Calibration Document Window

The Calibration Document window allows you to specify information about the calibration table.



Printer Setup Information



The *Printer Setup Information* box lists information about the printer type, ribbon, and paper type for which the printer will be calibrated.

Printer Description

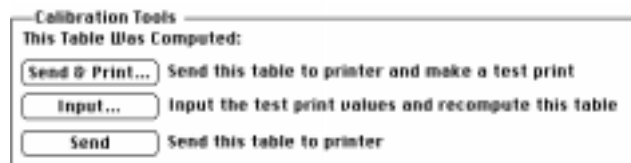
The *Printer Description* text box allows you to enter information that describes the printer for which the calibration table will be used. The text you enter is used to help describe the specifics of a particular calibration table. This text is not printed on the test print. An entry is optional. Use the Edit menu when you enter text.

Media Description

The *Media Description* text box allows you to enter information that describes the media for which the calibration table will be used. The text you enter is used to help describe the specifics of a particular calibration table. This text is not printed on the test print. An entry is optional. Use the Edit menu when you enter text.

Calibration Tools

Calibration Tools offers handling options for the calibration table.



Send & Print—sends the current calibration table to the printer. A calibration print is generated so you can evaluate the results.

Input—accesses the Input Test Print Values dialog boxes so you can enter *Visual Gray Balance*, *Visual Linearity*, and *Densitometer* data.

Send—sends the current calibration table to the printer without generating a calibration print. This button is usually used after you have created a test print and have recomputed the calibration table.

Appendix A Kodak XLS 8600 and Kodak DS 8650 Printers

Ribbon Media Choices

Kodak is introducing new thermal three-color (CMY) media ribbons (V1.5) which are improved versions of the V1.0 three-color (CMY) ribbons. These changes affect only KODAK EKTATHERM XLS Three-Color Ribbon products.

The Printer Setup for Calibration dialog box in the Calibration Utility allows you to select a media file in the *Media File* option. You must specify the media file that relates to the printer ribbon that your printer uses.

Check the tables on the following pages to determine which printer ribbon version (V1.0 or V1.5) your printer is using. Select the corresponding media file in the Printer Setup for Calibration *Media File* option when you use the Calibration Utility.

If you switch from the V1.0 ribbon to the new V1.5 ribbon, you must download new calibration tables to your printer. To do this, use the installation procedure “Using the Calibration Utility to Download Default Calibration Tables” on page A–4. Alternately, a specially designed downloader can be obtained from one of these sources:

- Kodak's World Wide Web site

<http://www.kodak.com/digitalImaging/digitalImaging.shtml>
(Select Dye SubPrinters/Media/V1.5)

- Your Kodak dealer
- Your regional Kodak technical support

Printer Ribbons (V1.0)

Product Name	Catalog Number	Product Code
KODAK EKTATHERM XLS Three-Color Ribbon /XTRALIFE Media	873–3925	5305
KODAK EKTATHERM XLS Oversize Three-Color Ribbon /XTRALIFE Media/CMY	162–7298	6304
KODAK EKTATHERM XLS Oversize Three-Color Ribbon /CMY	871–5963	7304
KODAK EKTATHERM XLS Three-Color Ribbon /CMY	887–3945	2336

Kodak XLS 8600 Media Files for V1.0

Windows 8600V100.RTB

Macintosh Kodak XLS 8600 Media V100

Kodak DS 8650 Media Files for V1.0

Windows 8650V100.RTB

Macintosh Kodak DS 8650 Media V100

Printer Ribbons (V1.5)

Product Name	Catalog Number	Product Code
KODAK EKTATHERM XLS Three-Color Ribbon /XTRALIFE Media V1.5	807–6135	5306
KODAK EKTATHERM XLS Oversize Three-Color Ribbon /XTRALIFE Media V1.5	801–3716	8304
KODAK EKTATHERM XLS Oversize Three-Color Ribbon /CMY V1.5	821–4082	7305
KODAK EKTATHERM XLS Three-Color Ribbon /CMY V1.5	163–0474	4336

Kodak XLS 8600 Media Files for V1.5

Windows 8600V150.RTB

Macintosh Kodak XLS 8600 Media V100

Kodak DS 8650 Media Files for V1.5

Windows 8650V150.RTB

Macintosh Kodak DS 8650 Media V100

Using the Calibration Utility to Download Default Calibration Tables

Check the tables on the previous pages to determine your printer ribbon version (V1.0 or V1.5). If your printer ribbon version does not match the calibration tables in your printer, you must download the correct calibration tables.

Putting Your Printer in Raster Mode

Use the printer front panel to place printer into Raster Mode for Calibration. After calibration is complete, this procedure may be used to place the printer in PostScript Mode for PostScript™ language printing.

1. Press the *Setup/Select* button to enter Setup Mode.
2. Press the *Cancel* (Scroll down) button until “Mode” appears.
3. Press the *Setup/Select* button.
4. Press the *Cancel* (Scroll down) button until the desired Print Mode (“Raster” or “PostScript”) appears.
5. Press the *Setup/Select* button.

An asterisk appears next to the desired Print Mode.

6. Press the *Cancel* (Scroll down) button until “Exit” appears.
7. Press the *Setup/Select* button to select “Exit.”
8. Press the *Cancel* (Scroll down) button until “Exit” appears.
9. Press the *Setup/Select* button to select “Exit.”

The message “Please Wait” appears for a minute or so while the printer initializes in the selected mode.

When the printer is initialized, the Print Mode, Donor Type, and Receiver Type are displayed.

Calibrating Your Printer for V1.5 Ribbon

Follow these steps to calibrate your printer for V1.5 printer ribbon.

1. Put your printer in Raster Mode via the printer's front panel.

NOTE: For instructions, refer to the previous section, "Putting Your Printer in Raster Mode."

2. Install the export module for your printer.

NOTE: For more information about installing the export module, refer to the export module user's guide.

3. Install the *Kodak Digital Science*™ Calibration Utility on your particular system.

- On a system running Windows:
 - Pull down the File menu and select *Run*.
 - Type **a:\setup** <enter>.

NOTE: Replace "a" in the above command with the appropriate drive letter, if necessary.

- Select printing and calibrating options.
- On a Macintosh system:
 - Select and drag the *Kodak DS Calibration Utility* folder onto your hard drive.

4. Start up the Calibration Utility.
5. Click on the *Launch Normal Utility* button in the Calibration Utility selection dialog.
6. Pull down the Printer menu and choose *Select Printer*.
7. Select *SCSI ID* or *Network*.
8. Pull down the File menu and select *New*.

The message "Create a new calibration table with these settings?" appears.

9. Select the *Change Setup* button.

The Printer Setup for Calibration dialog box appears.

IMPORTANT: *The following list of media type conditions must be updated for the new V1.5 ribbon media. Make each update from the Printer Setup for Calibration dialog box in the following order:*

1. Reflective with XtraLife
 2. Reflective without XtraLife
 3. Fast Transparency (Kodak DS 8650 only)
 4. Transparency
10. Select "Three-Color (CMY)" on the *Ribbon Type* drop-down menu.
 11. Select the media type on the *Print Mode* drop-down menu as specified in the above **IMPORTANT** note.
 12. Select or deselect the *XtraLife* check box in the Printer Setup for Calibration dialog box as specified for the media type that you are updating (refer to the above **IMPORTANT** note).
 13. Click on the *Select* button (located to the right of *Media File*).
 14. Specify a media file for your particular printer.
 - Kodak XLS 8600
 - Windows** 8600V150.RTB
 - Macintosh** Kodak XLS 8600 Media V150
 - Kodak DS 8650
 - Windows** 8650V150.RTB
 - Macintosh** Kodak DS 8650 Media V150
 15. Click on the *OK* button.
 16. Select the *Use Printer's Default Table* button in the *Starting Point* box in the Calibration Table dialog box.
 17. Click on the *OK* button.

A Calibration Document window appears.
 18. Click on the *Send* button.

The calibration table is sent to printer.

19. Pull down the Printer menu and choose *Printer Setup*.
20. Repeat steps 9 through 12, step 15, and step 18 for each of the media types listed in the **IMPORTANT** note on the previous page.
21. Exit the Calibration Utility.

Your printer is now calibrated for the new media.

Calibrating Your Printer for V1.0 Ribbon

To calibrate your printer for V1.0 printer ribbon, follow the instructions in “Calibrating Your Printer for V1.5 Ribbon,” but select the media file for V1.0 in step 14.

Remember to update all media type conditions:

- Kodak XLS 8600
 - Windows** 8600V100.RTB
 - Macintosh** Kodak XLS 8600 Media V100
- Kodak DS 8650
 - Windows** 8650V100.RTB
 - Macintosh** Kodak DS 8650 Media V100

Do I Need to Calibrate My Printer?

In order for your thermal prints to have the correct color balance, the printer ribbon must match the calibration tables contained in your printer.

- If your prints have a slight pinkish hue, you are using V1.5 printer ribbon with V1.0 calibration tables.
- If your prints have a slight greenish hue, you are using a V1.0 printer ribbon with V1.5 calibration tables.

Check the tables in this appendix to determine your printer ribbon version (V1.0 or V1.5). If your printer ribbon version does not match the calibration tables in your printer, you must download the correct calibration tables.

If the calibration tables are correct and you would like to improve the color balance, refer to the section entitled “Operating the Calibration Utility” for your particular computer platform in this manual.

Index

A

Amount of Correction, 1–47, 2–43
 Coarse, 1–30, 1–47, 2–26, 2–43
 Fine, 1–30, 1–47, 2–26, 2–43
 Normal, 1–30, 1–47, 2–26, 2–43

B

Begin, 1–49, 2–45
Begin with Previous Settings, 1–49, 2–45
Black-only ribbon, 1–6, 1–28, 2–4, 2–24

C

Calibrating printer, A–8
 for V1.0 ribbon, A–7
 for V1.5 ribbon, A–5 to A–7
 using test print, 1–14 to 1–15, 2–12 to 2–13
Calibration
 Densitometer, 1–39 to 1–44, 2–35 to 2–40
 running, 1–40 to 1–43, 2–36 to 2–39
 menu, option descriptions, 1–46 to 1–48, 2–42 to 2–44
 Densitometer, 1–48, 2–44
 Visual Gray Balance, 1–46 to 1–47, 2–42 to 2–43
 Visual Linearity, 1–47, 2–43
 table
 creating new, 1–16, 2–14
 opening, 1–16, 2–14
 opening existing, 1–26 to 1–27, 2–23
 saving, 1–15, 2–13
 Visual Gray Balance, 1–29 to 1–34, 2–25 to 2–30
 running, 1–30 to 1–34, 2–26 to 2–30
 Visual Linearity, 1–35 to 1–38, 2–31 to 2–34
 running, 1–36 to 1–38, 2–32 to 2–34

- Calibration document
 - creating new, 1–16, 1–19, 2–17
 - opening existing, 1–19, 2–17
 - table, 1–26 to 1–27, 2–23
 - selecting starting point, 1–20 to 1–25, 2–18 to 2–22
 - starting from previously created and saved, 1–16
 - starting point
 - using existing table, 1–23 to 1–25, 2–21 to 2–22
 - using printer's current calibration table, 1–20 to 1–21, 2–18 to 2–19
 - using printer's default table, 1–22, 2–20
 - using existing table, 1–23 to 1–25, 2–21 to 2–22
 - using printer's current calibration table, 1–20 to 1–21, 2–18 to 2–19
 - using printer's default table, 1–22, 2–20
- Calibration Document window
 - option descriptions, 1–52 to 1–53, 2–48 to 2–49
 - using, 1–28, 2–24
- Calibration Table dialog box, option descriptions, 1–50 to 1–51, 2–46 to 2–47
 - Calibration Tools, 1–53, 2–49
 - Cancel, 1–51, 2–47
 - Media Description, 1–53, 2–49
 - OK, 1–51, 2–47
 - Printer Description, 1–53, 2–48
 - Printer Setup, 1–50, 2–46
 - Printer Setup Information, 1–52, 2–48
 - Starting Point, 1–51, 2–47
- Calibration Tools, 1–53, 2–49
 - Input, 1–53, 2–49
 - Send, 1–53, 2–49
 - Send & Print, 1–53, 2–49
- Calibration Utility
 - for Macintosh systems, 2–1 to 2–49
 - for Microsoft Windows, 1–1 to 1–53
- Cancel, 1–51, 2–47

- Change Setup, 1–50, 2–46
- Close, 1–45, 2–41
- Coarse Visual Gray Balance, 1–30, 1–47, 2–26
- Configuration
 - minimum
 - Macintosh, 2–1
 - Windows, 1–1
 - recommended
 - Macintosh, 2–1
 - Windows, 1–1
- Copy Table from File, 1–51, 2–47
- Creating
 - new calibration document, 1–19, 2–17
 - new calibration table, 1–16, 2–14
 - test print, 1–12 to 1–13, 2–11 to 2–12

D

- Default calibration tables
 - loading, A–4 to A–7
 - sending to printer, 1–12, 1–13, 2–11
- Densitometer, 1–17, 1–48, 2–15, 2–44
 - calibration, 1–39 to 1–44, 2–35 to 2–40
 - running, 1–40 to 1–43, 2–36 to 2–39
 - Number of Squares, 1–48, 2–44
 - printer calibration
 - Macintosh, 2–35 to 2–40
 - Windows, 1–39 to 1–44
 - prints, 1–39, 2–35
 - status, 1–40, 2–36
 - Test Print, Number of Squares, 1–48, 2–44
- Density values, 1–43, 2–39
 - importing, 1–43, 1–44, 2–39, 2–40
- DS 8650 Printer, A–1 to A–8
 - ribbon media choices, A–1 to A–3
 - V1.0, A–2
 - V1.5, A–3

E

Easy Cal

calibration procedure

Easy Cal Step 1, 1-7 to 1-8, 2-5 to 2-6

Easy Cal Step 2, 1-8 to 1-10, 2-7 to 2-8

Easy Cal Step 3, 1-10 to 1-12, 2-9 to 2-10

Easy Cal Step 4, 1-12 to 1-13, 2-11 to 2-12

Easy Cal Step 5, 1-14 to 1-15, 2-12 to 2-13

Macintosh systems, 2-4 to 2-13

Windows systems, 1-6 to 1-15

menu option descriptions, 1-49, 2-45

Begin, 1-49, 2-45

Begin with Previous Settings, 1-49, 2-45

starting up

Macintosh systems, 2-3

Windows 3.1x, 1-3

Windows 95, 1-5

Easy Cal Step 1, 1-7 to 1-8, 2-5 to 2-6

Easy Cal Step 2, 1-8 to 1-10, 2-7 to 2-8

Easy Cal Step 3, 1-10 to 1-12, 2-9 to 2-10

Easy Cal Step 4, 1-12 to 1-13, 2-11 to 2-12

Easy Cal Step 5, 1-14 to 1-15, 2-12 to 2-13

Edit menu option descriptions, 1-46, 2-42

Exit, 1-45

Export module, 1-17, 2-5, 2-15

locating files for, 1-9, 2-7

selecting, 1-3, 1-4, 1-7 to 1-8, 1-16, 2-5 to 2-6, 2-14

F

File menu option descriptions, 1-45, 2-41

Close, 1-45, 2-41

Exit, 1-45

New, 1-45, 2-41

Open, 1-45, 2-41

Preferences, 1-45, 2-41

Quit, 2-41

Revert, 1-45, 2-41

Save, 1-45

Save As, 1-45, 2-41

Fine Visual Gray Balance, 1-30, 1-47, 2-26

I

Import, 1–44, 2–40
 End of Field Character, 1–44, 2–40
 End of Record Character, 1–44, 2–40
 module, 1–17, 1–44, 2–15, 2–40
 for densitometer settings, 1–17
 Open, 1–44, 2–40
Input, 1–53, 2–49
Introduction, v

K

Kodak DS 8650 Printer, A–1 to A–8
 ribbon media choices, A–1 to A–3
 V1.0, A–2
 V1.5, A–3
Kodak XLS 8600 Printer, A–1 to A–8
 ribbon media choices, A–1 to A–3
 V1.0, A–2
 V1.5, A–3

L

Linearity Reference Card, using, 1–35, 1–38, 2–31, 2–33

M

Macintosh system
 starting Calibration Utility on, 2–3
Media, selecting, 1–10 to 1–12, 2–9 to 2–10
 in Printer Setup for Calibration dialog box, 1–18, 2–16
Media Description, 1–53, 2–49
Most neutral cluster, 1–32, 2–28

N

Neutral gray, choosing, 1–14, 1–29, 2–12, 2–25
New, 1–45, 2–41
New calibration table, creating, 1–16, 2–14
Normal Utility, starting up
 Macintosh systems, 2–3
 Windows 3.1x, 1–3
 Windows 95, 1–5
Normal Utility calibration procedure
 Macintosh systems, 2–14 to 2–40
 printer calibration, 2–25 to 2–40
 Windows systems, 1–16 to 1–44
 printer calibration, 1–29 to 1–44
Normal Visual Gray Balance, 1–30, 1–47, 2–26
Number of Squares, 1–48, 2–44

O

OK, 1–51, 2–47
Open, 1–45, 2–41
Opening
 existing calibration document, 1–19, 2–17
 existing calibration table, 1–16, 2–14
Operating Calibration Utility
 Macintosh systems, 2–3 to 2–40
 using Easy Cal
 Easy Cal Step 1, 1–7 to 1–8, 2–5 to 2–6
 Easy Cal Step 2, 1–8 to 1–10, 2–7 to 2–8
 Easy Cal Step 3, 1–10 to 1–12, 2–9 to 2–10
 Easy Cal Step 4, 1–12 to 1–13, 2–11 to 2–12
 Easy Cal Step 5, 1–14 to 1–15, 2–12 to 2–13
 Macintosh systems, 2–4 to 2–13
 Windows systems, 1–6 to 1–15
 using Normal Utility
 Macintosh systems, 2–14 to 2–40
 Windows systems, 1–16 to 1–44
 Windows systems, 1–3 to 1–44
Option descriptions, 1–45 to 1–53, 2–41 to 2–49

P

- Preferences, 1–45, 2–41
 - setting, 1–17, 2–15
- Printer
 - media, selecting, 1–10 to 1–12, 2–9 to 2–10
 - menu option descriptions, 1–49, 2–45
 - Printer Setup, 1–49, 2–45
 - Select Printer, 1–49, 2–45
 - model, selecting, 1–7 to 1–10, 2–5 to 2–6, 2–7 to 2–8
 - selecting, 1–18, 2–16
 - setting up, 1–18, 2–16
- Printer calibration, 1–29 to 1–44, 2–25 to 2–40
 - Densitometer
 - Macintosh, 2–35 to 2–40
 - Windows, 1–39 to 1–44
 - Visual Gray Balance
 - Macintosh, 2–25 to 2–30
 - Windows, 1–29 to 1–34
 - Visual Linearity
 - Macintosh, 2–31 to 2–34
 - Windows, 1–35 to 1–38
- Printer Description, 1–53, 2–48
- Printer Setup, 1–49, 1–50, 2–45, 2–46
 - Change Setup, 1–50, 2–46
- Printer Setup for Calibration dialog box, 1–18, 2–16
- Printer Setup Information, 1–52, 2–48
- Printing test print, 1–12 to 1–13, 2–11 to 2–12

Q

- Quit, 2–41

R

- Raster Mode, putting printer in, A–4
- Read Current Table From Printer, 1–51, 2–47
- Reference Card, 1–35
- Revert, 1–45, 2–41
- Ribbon media choices, A–1 to A–3
 - V1.0, A–2
 - V1.5, A–3

S

- Save, 1–45
- Save As, 1–45, 2–41
- Saving calibration tables, 1–15, 2–13
- Select File, 1–51, 2–47
- Select Printer, 1–49, 2–45
- Selecting
 - export module, 1–7 to 1–8, 2–5 to 2–6
 - printer, 1–18, 2–16
 - media, 1–10 to 1–12, 2–9 to 2–10
 - model, 1–7 to 1–10, 2–5 to 2–6, 2–7 to 2–8
- Send, 1–53, 2–49
- Send & Print, 1–53, 2–49
- Setting preferences, 1–17, 2–15
- Starting Calibration Utility
 - in Windows 3.1x, 1–3 to 1–4
 - in Windows 95, 1–4 to 1–5
 - on Macintosh system, 2–3
- Starting Point, 1–51, 2–47
 - Copy Table from File, 1–51, 2–47
 - Read Current Table From Printer, 1–51, 2–47
 - Select File, 1–51, 2–47
 - Use Printer's Default Table, 1–51, 2–47
- System configuration
 - minimum
 - Macintosh, 2–1
 - Windows, 1–1
 - recommended
 - Macintosh, 2–1
 - Windows, 1–1
- System requirements
 - Macintosh, 2–1
 - Windows, 1–1

T

- Test print
 - creating, 1–12 to 1–13, 2–11 to 2–12
 - using to calibrate printer, 1–14 to 1–15, 2–12 to 2–13

U

Use Printer's Default Table, 1–51, 2–47
Using Calibration Document window, 1–28, 2–24

V

Visual Gray Balance, 1–46 to 1–47, 2–42 to 2–43
 Amount of Correction, 1–47, 2–43
 Coarse, 1–30, 1–47, 2–26, 2–43
 Fine, 1–30, 1–47, 2–26, 2–43
 Normal, 1–30, 1–47, 2–26, 2–43
 calibration, 1–6, 1–29 to 1–34, 2–4, 2–25 to 2–30
 running, 1–30 to 1–34, 2–26 to 2–30
 printer calibration
 Macintosh, 2–25 to 2–30
 Windows, 1–29 to 1–34
Visual Linearity, 1–47, 2–43
 calibration, 1–35 to 1–38, 2–31 to 2–34
 running, 1–36 to 1–38, 2–32 to 2–34
 printer calibration
 Macintosh, 2–31 to 2–34
 Windows, 1–35 to 1–38

W

Windows 3.1x
 starting Calibration Utility in, 1–3 to 1–4

Windows 95
 starting Calibration Utility in, 1–4 to 1–5

X

XLS 8600 Printer, A–1 to A–8
 ribbon media choices, A–1 to A–3
 V1.0, A–2
 V1.5, A–3

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